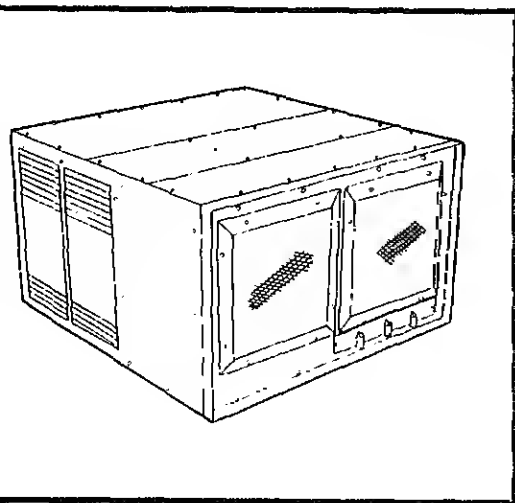


**ATOR'S, ORGANIZATIONAL,
AND DIRECT SUPPORT
MAINTENANCE MANUAL**

**AIR CONDITIONER
000 BTU/HR COOLING**



**(HOTTEL MODEL HAC-751)
(4120-01-085-4732)**

RETURN TO GOV. DOCS. CENTER

TROUBLESHOOTING 3-1

**OPERATOR'S
MAINTENANCE 3-1**

**ORGANIZATIONAL
MAINTENANCE 4-1**

TROUBLESHOOTING 4-22

DS MAINTENANCE 5-1

APPENDICES A-1

INDEX 1

*This copy is a reprint which includes current
pages from Change 1.*

TM 5-4120-341-13, 13 March 1981, is changed as follows:

1. The U.S. Air Force number is being added to this manual. All future editions or revisions will include the U.S. Air Force.
2. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

i and ii
F-1 and F-2

Insert pages

i and ii
F-1 and F-2
F-3/F-4

3. Retain this sheet in front of manual for reference purposes.

Order of the Secretaries of the Army and the Air Force:

Official:

R. L. DILWORTH
Adjutant General, United States Army
The Adjutant General

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

ALFRED G. HANSEN
General, USAF, Commander, Air Force
Logistics Command

LARRY E. WELSH, General
Chief of Staff



Disconnect the power source before performing any maintenance function.

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).

Death or serious injury may occur if capacitor is not discharged prior to removal.

Avoid bodily contact with liquid refrigerant and avoid inhaling refrigerant gas. Be especially careful that Refrigerant 12 does not come in contact with eyes. In case of refrigerant leaks, ventilate area immediately.

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200° F creates phosgene gas.

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

ou can help improve this manual. If you find any mistakes or if you know
f a way to improve the procedures, please let us know. Reports shall be
ubmitted as follows: A reply will be furnished to you.

A) Army - DA Form 2028 (Recommended Changes to Publications and Blank
orms), or DA Form 2028-2 located in the back of this manual direct to
ommander, U. S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300
oodfellow Boulevard, St. Louis, MO 63120-1798 .

F) Air Force - AFTO Form 22 directly to: Commander, Sacramento Air
ogistics Center, ATTN: MMST, McClellan Air Force Base, CA 95652 in
ccordance with TO-00-5-1.

CHAPTER 1**INTRODUCTION****CHAPTER OVERVIEW****Section I****GENERAL INFORMATION****1-1****Scope****1-2****Maintenance Forms and Records****1-3****Destruction of Army Material To Prevent Enemy Use****1-4****Reporting Equipment Improvements Recommendations (EIR's)****1-5****List of Abbreviations****1-6****Hand Receipt****Section II****EQUIPMENT DESCRIPTION****1-7****Purpose of Air Conditioner****1-8****Location and Description of Major Components****1-9****Differences Between Models****1-10****Performance Data (Organizational Maintenance)****1-11****Performance Data (Direct Support Maintenance)****Section III****TECHNICAL PRINCIPLES OF OPERATION****1-12****General****1-13****Cooling****1-14****Ventilation****CHAPTER 2****OPERATING INSTRUCTIONS****CHAPTER OVERVIEW****Section I****PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)****2-1****General****2-2****Operator/Crew Preventive Maintenance Checks and Services (PMCS)**

	3-2	General	3-2
	3-3	Troubleshooting Table	3-3
Section	III	OPERATOR'S MAINTENANCE PROCEDURES	3-2
	3-4	General	3-2
	3-5	Housing Panels	3-3
	3-6	Air Diffuser and Return Air Grills	3-6
	3-7	Control Panel Switches	3-9
APTER 4		ORGANIZATIONAL MAINTENANCE INSTRUCTIONS	4-1
		CHAPTER OVERVIEW	4-1
Section	I	REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT	4-1
	4-1	Maintenance Repair Parts	4-1
	4-2	Common Tools and Equipment	4-1
	4-3	Special Tools and Test Equipment	4-1
	4-4	Consumable Materials	4-1
Section	II	SERVICE UPON RECEIPT	4-2
	4-5	Service Upon Receipt Checklist	4-2
Section	III	OPERATION UNDER USUAL CONDITIONS	2-4
	4-6	Assembly and Preparation For Typical Use	2-4
	4-7	Position the Unit	2-4
	4-8	Mount the Unit	2-4
	4-9	Connect the Power Source	2-5
	4-10	Initial Adjustments	2-6
	4-11	Fan Rotation Check	2-6
	4-12	Return Air Grill Check	2-7
Section	IV	PREVENTIVE MAINTENANCE CHECKS AND SERVICES	
		(PMCS) ORGANIZATIONAL	4-8
	4-13	General	4-8
	4-14	Preventive Maintenance Checks and Services (PMCS)	4-8
Section	V	ORGANIZATIONAL TROUBLESHOOTING	4-22
	4-15	General	4-22
	4-16	Organizational Troubleshooting Table	4-22
Section	VI	ORGANIZATIONAL MAINTENANCE PROCEDURES	4-25
	4-17	General	4-25
	4-18	Housing Panels and Grills	4-26
	4-19	Air Filter	4-32
	4-20	Fan Motor	4-34
	4-21	Condenser Fan	4-41
	4-22	Circulating Fan	4-48
	4-23	Selector Switch	4-53
	4-24	Thermostat Switch	4-57
	4-25	Motor Capacitor	4-61
	4-26	Start Capacitor	4-61

Section	III	DIRECT SUPPORT OPERATOR'S MAINTENANCE PROCEDURES
	5-7	General
	5-8	Refrigerant Servicing
	5-9	Compressor
	5-10	Refrigerant Piping and Service Valves
	5-11	Evaporator Coil
	5-12	Condenser Coil
	5-13	Dehydrator
	5-14	Sight Glass
	5-15	Expansion Valve

APPENDICES

ENDIX A	REFERENCES
ENDIX B	COMPONENTS OF END ITEM LIST
ENDIX C	MAINTENANCE ALLOCATION CHART
ENDIX D	ADDITIONAL ORGANIZATION LIST
ENDIX E	EXPENDABLE SUPPLIES AND MATERIALS LIST
ENDIX F	DIAGRAMS

INDEX

purpose of this chapter is two-fold:

- To provide you with the standard data required in all manuals (i.e. forms and record data).
- To acquaint you with the air conditioner. This is done by giving you a physical and functional description of those major equipment parts that you are likely to come in contact with.

Section I. GENERAL INFORMATION

SCOPE

of Manual: Operator's, Organizational, and Direct Support Maintenance

1. Number and Equipment Name: HAC-751 Air Conditioner: Floor Mounted, Air Cooled, 1/2 Horsepower Driven, 3/4 HP, 60 Hertz AC, Single Phase, 9,000 BTU/HR

2. Use of Equipment: Provide filtered, cooled air to a desired predetermined range and circulating air to provide cooling of equipment or personnel within the air conditioned area.

MAINTENANCE FORMS AND RECORDS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed in TM 38-750, the Army Maintenance Management Systems (TAMMS).

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Refer to TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use, for information on destruction.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs)

If your air conditioner needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design, why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it directly to the Commander, U.S. Army Troop and Aviation Materiel Readiness Command, ATTN: DRSTS-MEMO, 1000 North Boulevard, St. Louis, MO 63120.

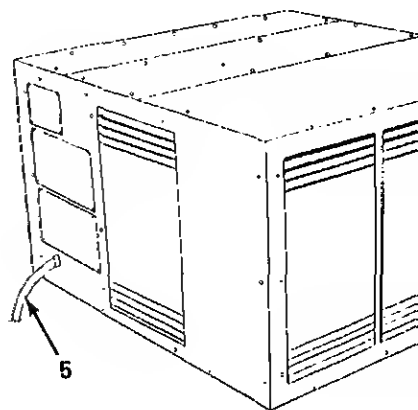
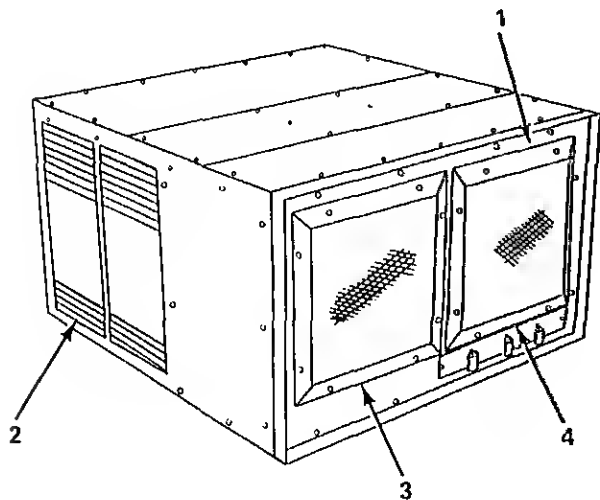
LIST OF ABBREVIATIONS

BTU/HR	British Thermal Units Per Hour	ampere	I	
		Celsius	lb	
PR	Compressor	OD	psi	Outside D
				pounds per square

4. Compressor
5. Evaporator coil, expansion valves, and piping
6. Condenser coil, dehydrator, valves and piping

1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

1. Return Air Grill - Adjustable and controls the amount of air passing through the air condenser.
2. Condenser Inlet - Directs flow of air to condenser.
3. Air Diffuser Grill - Directs flow of evaporator outlet air.
4. Control Panel - Contains all control switches.
5. Power Cable - For connection to 115 volts, 60 Hz, single phase power source.



Air Conditioner, Floor Mounted, 9,000 BTU/HR, 115 Volts, Single Phase, 60 Hertz.

Manufacturer	Harvey W. Hottel, Incorporated
National Stock Number	4120-01-085-473
Model	HAC-75
Length	27 5/8 in. (701.675 mm)
Width	26 1/2 in. (673.1 mm)
Height	15 5/8 in. (396.875 mm)
Capacity	9,000 BTU/HR
Weight	153 lbs. (69.40 kg)

Compressor (B1).

Manufacturer	Hupp, Incorporated
Model	EH751A255
Military Part Number	13221E455
Volts	115
Hertz	50/60
Phase	Single
Weight (with oil)	70 pounds

Fan Motor (B2).

Manufacturer	Dayton Electric Mfg. Company
Model	3M064A
Military Part Number	13221E458
Volts	115
Phase	Single
RPM	1250/1550
Horsepower	1/4
Duty	Continuous
Motor Drive	Direct
Thermal Protector	Automatic reset type open at 165°C (329°F)
Rotation (lead end)	Counterclockwise

Start Capacitor (C1).

Manufacturer	Cornell Dubilier Electronic
Part Number	ETW460-12
Military Part Number	13221E458
Type	Fixed aluminum electrolytic
Capacitance	500mfd± 8%
Working Voltage	125 VAC

Run Capacitor (C2).

Manufacturer	General Electric Company
Part Number	21L300
Type	Fixed paper
Capacitance	7.5 mfd
Working Voltage	370 VAC

Part Relay (R1).
 Manufacturer General Electric Company
 Part Number 3ARR3B-2
 Military Part Number 13221E48
 Type Volt.
 Contacts Open 140 to 153 volts at 35°C (95°F), 150 to 160 volts at 95°C (203°F)
 Contacts Close 20 to 45 volts

Rotary Selector Switch (S1).

Manufacturer Oak Industries, Incorporated
 Part Number 240TH-
 Military Part Number 13221E49
 Type SPST
 Number of Switch Positions

Thermostat (S2).

Manufacturer Raytheon
 Part Number A30-17
 Military Part Number 13221E48
 Type SPST, normally closed
 Contacts Close (temp. drop) 69°F to 71°F (20.6°C to 21.7°C)

Expansion Valve

Manufacturer The Singer Co., Controls Division
 Part Number 223-1
 Military Part Number 13221E48
 Inlet 1/4 O.D.
 Outlet 1/2 O.D.
 Cap. Tube Length 60 in. (1,524 mm)
 Nominal Capacity 1/2 ton
 Superheat (factory set) 8 1/2°F to 9 1/2°F bath temperature (-13°C to 12.5°C)
 at a 0°C bath temperature

Sight Glass.

Manufacturer Mueller Brass
 Part Number A159
 Military Part Number 13221E48

PERFORMANCE DATA (DIRECT SUPPORT MAINTENANCE)

Dehydrator

Manufacturer Sporlan
 Part Number CO-1
 Military Part Number 13214E3

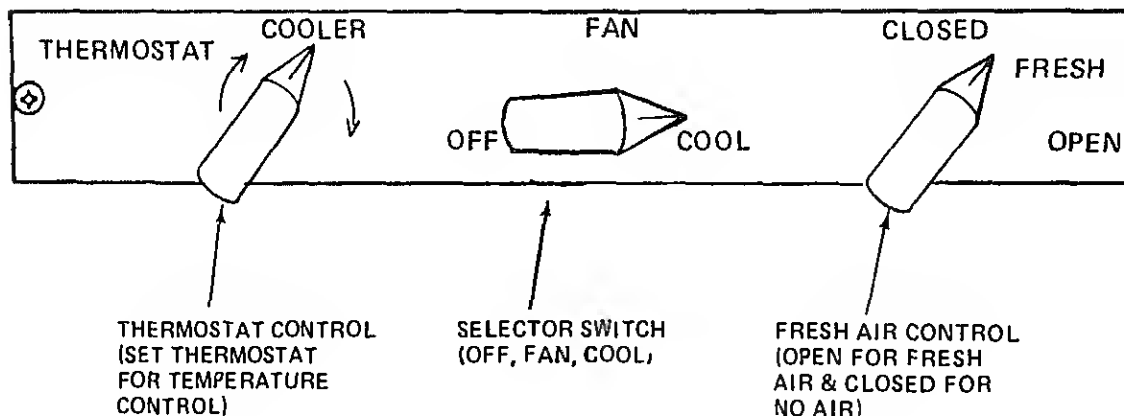
Refrigerant Service Valves.

Manufacturer Robinair Mfg. Corporation
 Part Number V-1

The air conditioner is a floor-mounted, self-contained, electric motor driven unit that provides BTU/HR for cooling. Once started, it operates automatically due to the relationship of the controls and instruments.

1-13. COOLING

With the selector switch in the COOL position the fan motor and the compressor are energized and motor and compressor run continuously. The flow within the refrigerant circuit determines the mode of unit. With the fan motor and compressor operating, the flow within the refrigerant circuit is controlled by the THERMOSTAT switch.





A schematic diagram showing a horizontal line representing a circuit. Three switches are connected in series to this line. Each switch is represented by a diamond shape with a vertical line passing through its center. Arrows point from text labels below to each of the three switches.

THERMOSTAT CONTROL
(SET THERMOSTAT
FOR TEMPERATURE
CONTROL)

SELECTION SWITCH
(OFF, FAN, COOL)

FRESH AIR CONTROL
(OPEN FOR FRESH
AIR & CLOSED FOR
NO AIR)

to operate the air conditioner. For your convenience, below is an index of this chapter.

INDEX

	Para	Page
<i>Operating Instructions on Decals and Instruction Plates</i>	2-7	2-9
<i>Operating Procedures</i>	2-3	2-6
<i>Operation Under Unusual Conditions</i>	2-8	2-10
<i>Preventive Maintenance Checks and Services</i>	2-2	2-2

After you operate, be sure to perform (A) PMCS after operation.

If your equipment fails to operate. Troubleshoot with proper equipment. Report any deficiencies on proper forms, see TM 38-750.

2. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

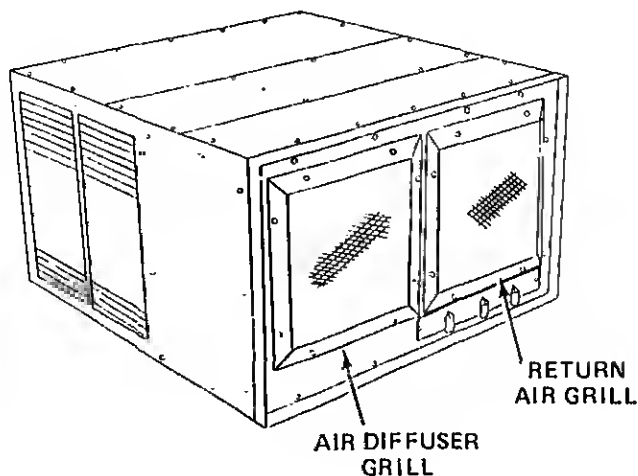
NOTE

If the equipment must be kept on continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

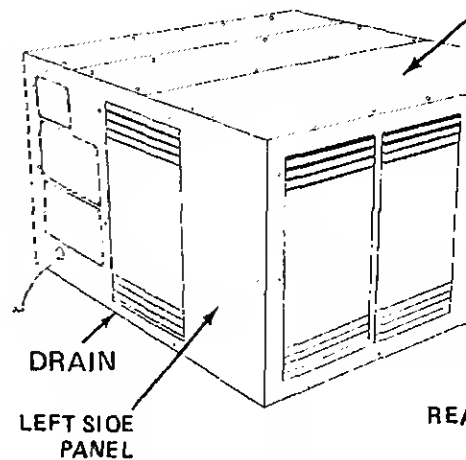
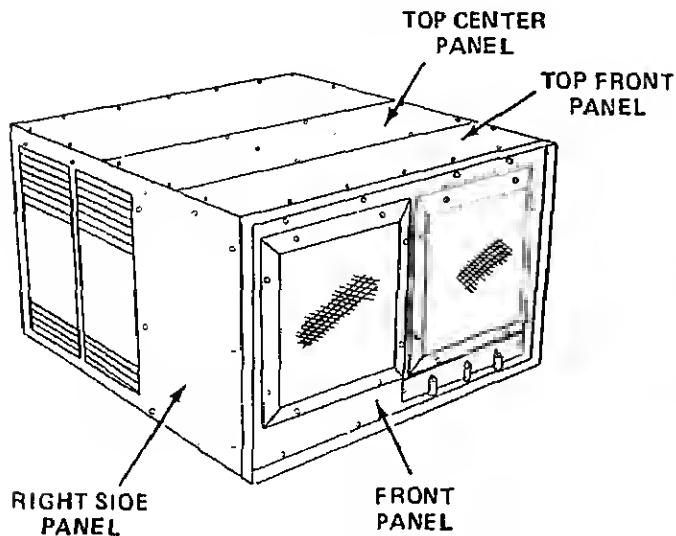
Return Air Grill

Inspect and adjust return air grill.
organizational maintenance personnel.

Inspect for cleanliness, obstructions, damage, and security of attachment. Rotate FRESH AIR control to adjust return air grill.



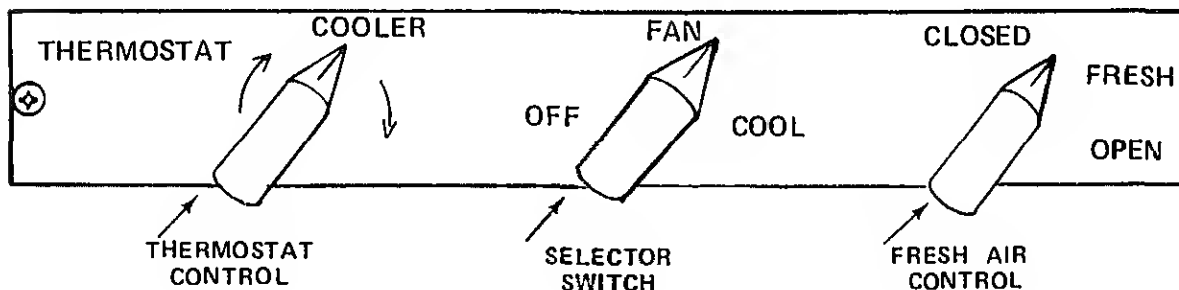
Item No.	Interval			Item to be Inspected	Procedures Check For and Have Repaired or Adjusted As Necessary	Fo. Readiness Re Equipment is Not Available If
	B	D	A			
3	●		●	Housing Panels	Inspect for security of attachment and cleanliness. Report damaged condition to organizational maintenance personnel.	
4	●		●	Drains	Inspect drains for obstructions. Remove obstructions as required.	



5

Switches

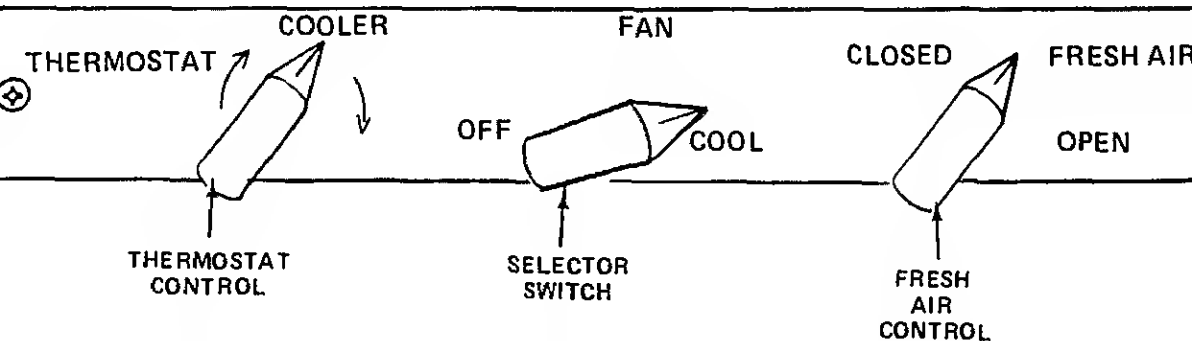
Insure knobs are in place and check to see that switches function properly. Report damaged condition to organizational maintenance personnel.



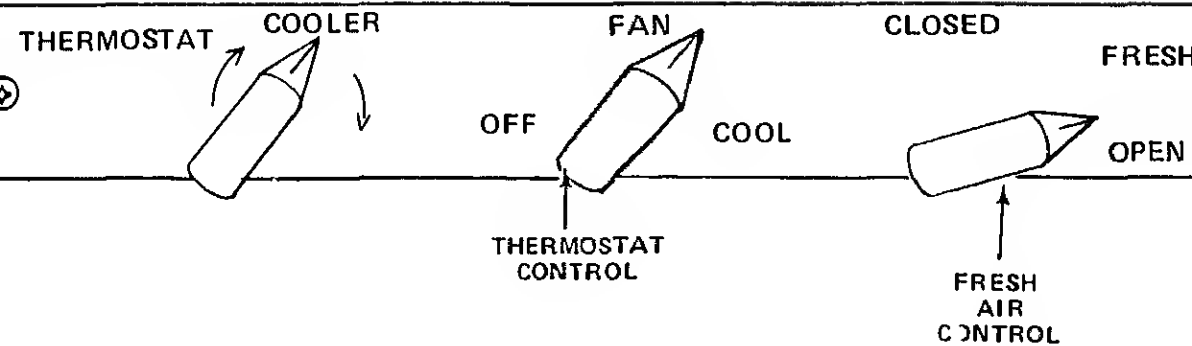
NOTE

Only the **COOLER** position for the **THERMOSTAT** is marked on the front panel.

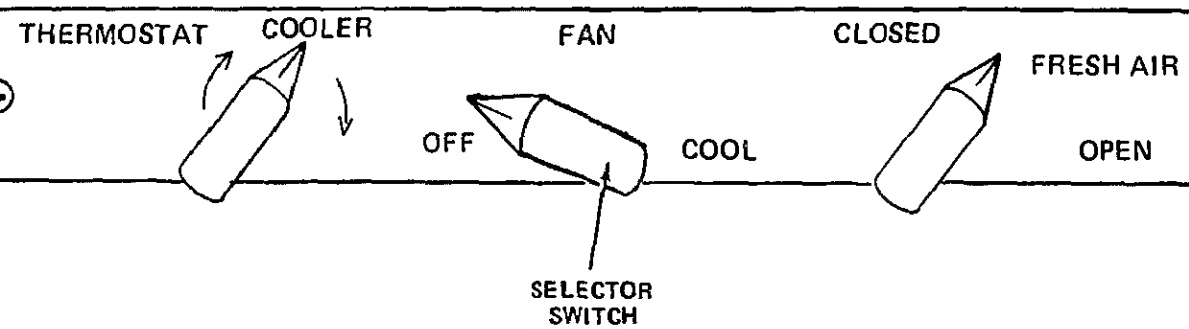
- Set **THERMOSTAT** control to desired temperature.
- Place **FRESH AIR** control in desired position (**OPEN** for fresh air and **CLOSED** for no air).
- Place selector switch in the **FAN** position to start fans.
- Place selector switch in the **COOL** position. When the temperature in the area is above that of **THERMOSTAT** setting, the air conditioner will provide cooling air.





3. Place selector switch in the FAN position.





2. Place FRESH AIR control in the CLOSED position.



HERMOSTAT  COOLER

OFF  FAN

COOL  CLOSED

FRESH AIR  OPEN

U. S. ARMY TROOP SUPPORT COMMAND			
AIR CONDITIONER: FLOOR MTG; AIR COOLED; ELECTRIC MOTOR DRIVEN, 3/4-HP AC 115V, SINGLE PHASE, 60 HZ: 9000BTU/HR			
NSN 4120-01-085-4732			
PART NO. ASSY 97403-13221E4580			
MFD BY HARVEY W. HOTTEL, INC.			
CONTRACT NO. DAAJ09-79-C-5143			
DATE <input type="text"/>			
SERIAL NO. <input type="text"/>		WT <input type="text"/>	

check the unit and

b. *Filters.* To maintain the highest capacity of the unit, the return air filter and fresh air screen should be cleaned weekly or more often if necessary. Dirty filters reduce the flow of air across the evaporator coils, thereby reducing the capacity of the air conditioner.

c. *Grills and Louvers.* Keep all grills and louvers clean and free of any obstructions to maintain full air flow through the air conditioner.

d. *Coils.* Clean evaporator and condenser coils as frequently as necessary to prevent dirt or other material from obstructing the air flow.

2.9. OPERATION IN DUSTY OR SANDY AREAS

a. *Protection.* Shield the air conditioner from dust as much as possible. Take advantage of any natural barriers which offer protection.

b. *Cleaning.* Keep the air conditioner as clean as possible. Pay particular attention to the louvers, filters, coils, electrical components and grills.

c. *Air Filters and Coils.*

(1) Under extremely dusty or sandy conditions, the louvers, coils, electrical components and grills must be serviced more often.

NOTE

Never operate the unit without having the air filters in place.

(2) The condenser coil is subjected to ambient air. Therefore, it requires cleaning more often than the evaporator coil.

wiring or other electrical parts.

2-11. OPERATION IN SALT WATER AREAS

a. General. Wash the exterior and condenser section of the unit, particularly condenser and louver control mechanism, with clean fresh water at frequent intervals. Be careful not to damage system with water. Special attention must be given to prevent rust and corrosion.

WARNING

Disconnect power source prior to washing the air conditioner.

b. Painting. Paint all exposed areas where paint has cracked, peeled or blistered or report to organizational maintenance. Coat all exposed areas of polished metal with a light coat of grease.

INDEX

	Para	Page
Lubrication Instructions	3-1	3-1
Operator Troubleshooting	3-2	3-1
Operator Troubleshooting Table	3-3	3-1
Operator's Maintenance Procedures	3-4	3-2

Section I. LUBRICATION INSTRUCTIONS

No lubrication is required.

Section II. TROUBLESHOOTING

GENERAL

This section provides information useful in diagnosing and correcting unsatisfactory operation of the air conditioner. Each malfunction is followed by a list of probable causes and actions to remedy the malfunction. You should perform the tests/inspections and corrective actions in the order listed. This manual cannot list all malfunctions that may occur; nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

TROUBLESHOOTING TABLE

Malfunction

Test or Inspection

Corrective Action

AIR CONDITIONER

AIR CONDITIONER FAILS TO OPERATE

- Step 1.* Check to see if main power cord is plugged in.
Connect power cable to receptacle supplying 115 VAC, single phase, 60 Hz power.
- Step 2.* Check to see if selector switch is in OFF position.
Place selector switch in FAN or COOL position.

INSUFFICIENT COOLING

- Step 1.* Check to see if selector switch is in COOL position.
Place selector switch in COOL position.

3-4. GENERAL

The following information pertains to all procedures for the operator.

INITIAL SETUP

Applicable Configurations
All

Special Environmental Conditions
None

Test Equipment
None

Special Tools
None

Personnel Required
Operator

General Safety Instructions

Disconnect the power source before performing maintenance function. Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective guarding and personal protective equipment.

Top Center Panel
 Top Rear Panel
 Right Side Panel
 Rear Panel
 Dry Cleaning Solvent

None

Approximate Time Required (in minutes)

Inspection and Service 15
 TOTAL TIME 15

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

INSPECTION AND SERVICE

FRONT OF HOUSING

WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).

Front Panel

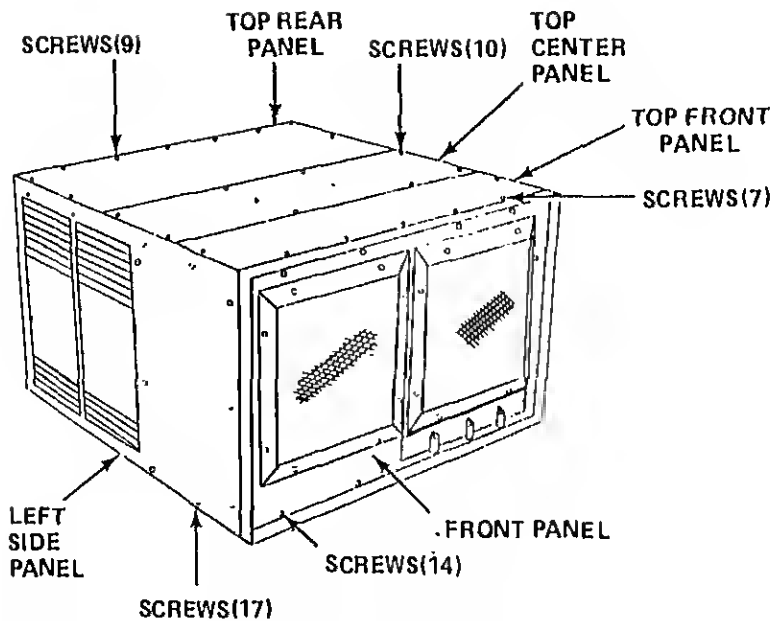
- Brush off any loose dirt or foreign matter from front panel.
- Wipe off front panel with a cloth moistened with dry cleaning solvent, P-D-680 or P-S-661.
- Inspect front panel for security of attachment and damage.
- Report damaged condition to organization maintenance personnel.

Left Side Panel

- Brush off any loose dirt or foreign matter from left side panel.
- Wipe off left side panel with a cloth moistened with dry cleaning solvent, P-D-680 or P-S-661.
- Inspect left side panel for security of attachment and damage.
- Report damaged condition to organization maintenance personnel.

3. Top Panels

- a. Brush off any loose dirt or force from top panels.
- b. Wipe off top panels with a cloth with dry cleaning solvent, P-D-680.
- c. Inspect top panels for security of and damage.
- d. Report damaged condition to org maintenance personnel.



WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

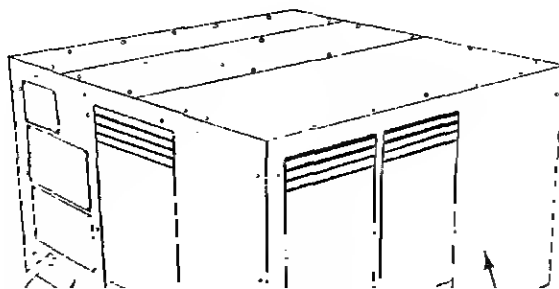
4. Rear Panel

- a. Brush off any loose dirt or foreign material from rear panel.
- b. Wipe off rear panel with a cloth moistened with dry cleaning solvent, P-D-680 or P-S-661.
- c. Inspect rear panel for security of attachment and damage.
- d. Report damaged condition to organizational maintenance personnel.

RIGHT SIDE OF HOUSING

5. Right Side Panel

- a. Brush off any loose dirt or foreign material from right side panel.
- b. Wipe off right side panel with a cloth moistened with dry cleaning solvent, P-D-680 or P-S-661.
- c. Inspect right side panel for security of attachment and damage.
- d. Report damaged condition to organizational maintenance personnel.



IAL SETUP**Material/Parts**

Air Diffuser Grill
Return Air Grill
Dry Cleaning Solvent

References

None

Troubleshooting Reference

AIR CONDITIONER, Malfunction 2, Step

Approximate Time Required (in minutes)

Inspection and Service	15
Adjustment	5
TOTAL TIME	20

LOCATION/ITEM**REMARKS****ACTION****PECTION AND SERVICE****ONT OF HOUSING****WARNING**

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near flame or excessive heat. Flash point of solvent is 100° F (38° C).

Air Diffuser Grill

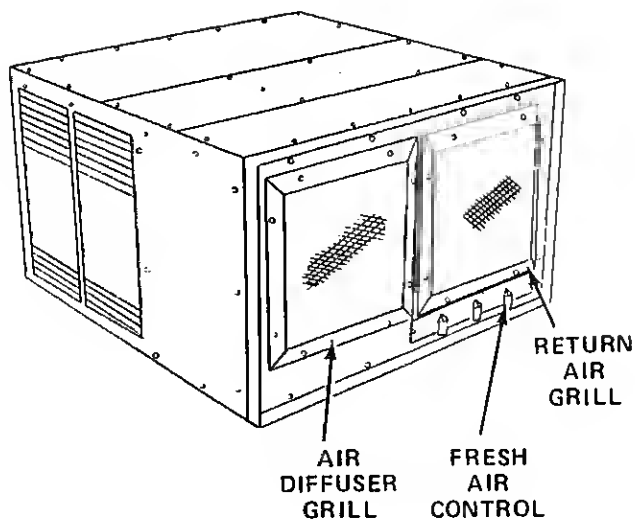
- Brush off any loose dirt or foreign material from air diffuser grill.
- Wipe off air diffuser grill with a cloth moistened with dry cleaning solvent, P-D-680 or P-S-661.
- Inspect for and remove any obstructions.
- Inspect air diffuser grill for security of attachment and damage.
- Report damaged condition to organizational maintenance personnel.

Return Air Grill

- Brush off any loose dirt or foreign material from return air grill.
- Wipe off return air grill with a cloth moistened with dry cleaning solvent, P-D-680 or P-S-661.
- Inspect for and remove any obstructions.
- Inspect return air grill for security of attachment and damage.
- Report damaged condition to organizational maintenance personnel.

3. Return Air Grill

- a. Adjust return air grill louvers by rotating air control from CLOSED to FRESH OPEN positions.
- b. Verify return air grill louvers operate from
- c. Report damaged condition to organization maintenance personnel.



References
None

Approximate Time Required (in minutes)
Inspection and Service 5
TOTAL TIME 5

LOCATION/ITEM

REMARKS

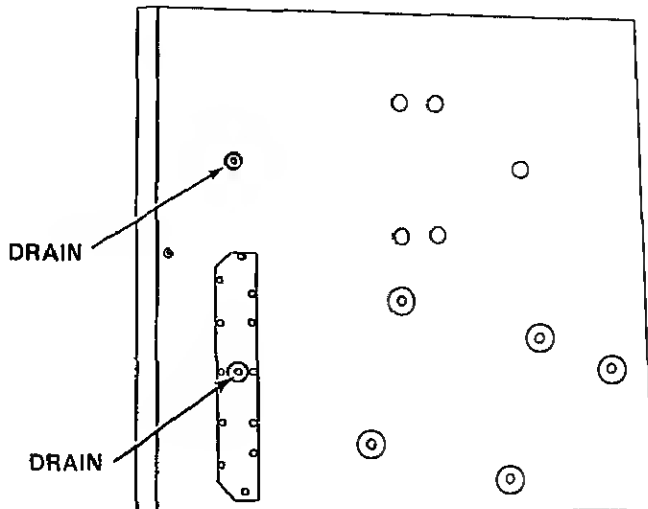
ACTION

INSPECTION AND SERVICE

FRONT OR REAR

Drains

- a. Inspect drains for obstructions.
- b. Use a piece of soft wire to remove obstructions.



AL SETUP
Material/Parts
None

Troubleshooting Reference

AIR CONDITIONER, Malfunction 1, S
AIR CONDITIONER, Malfunction 2, S
AIR CONDITIONER, Malfunction 2, S

References
None

Approximate Time Required (in minutes)

Inspection 5
TOTAL TIME 5

LOCATION/ITEM

REMARKS

ACTION

SECTION

CONTROL PANEL

Thermostat Control

- a. Insure knob is in place and control moves freely.
- b. Report damaged condition to organization maintenance personnel.

Selector Switch

- a. Insure knob is in place and switch moves from position to position and functions properly.
- b. Report damaged condition to organization maintenance personnel.

Fresh Air Control

- a. Insure knob is in place and check to see that control moves freely between positions.
- b. Report damaged condition to organization maintenance personnel.

THERMOSTAT



FAN



CLOSED



FRESH AIR

Common Tools and Equipment	4-2
Consumable Materials	4-4
Maintenance Repair Parts	4-1
Organizational Maintenance Procedures	4-17
Organizational Troubleshooting	4-15
Organizational Troubleshooting Table	4-16
Organizational Preventive Maintenance Checks and Services (PMCS)	4-14
Preparation For Movement	4-36
Service Upon Receipt Checklist	4-5
Special Tools and Test Equipment	4-3

Section I. REPAIR PARTS, SPECIAL TOOLS, TMD AND SUPPORT EQUIPMENT

MAINTENANCE REPAIR PARTS

air parts for the air conditioner are listed and illustrated in TM 5-4120-341-23P.

COMMON TOOLS AND EQUIPMENT

common tools and equipment, refer to the Table of Organization and Equipment (TOE).

SPECIAL TOOLS AND TEST EQUIPMENT

pecial tools or test equipment are required.

CONSUMABLE MATERIALS

Item No.	Name	Specific
1	Coater, Air Filter	MIL-L-2
2	Dry Cleaning Solvent	P-D-680
3	Dry Cleaning Solvent	P-S-661
4	Adhesive	MMM-A

and Grills

b. Service or reject any component if damage prevents the air conditioner from working properly.

2 Front

Air Filter

a. Remove top front panel.

Paragraph

b. Remove air filter and inspect the filter for accumulation of dirt.

c. Clean or reject filter.

3 Front

Return Air Grill

a. Check to see that the FRESH AIR control moves freely between the OPEN and CLOSED position and that the return air grill opens and closes properly.

Paragraph

b. Adjust or reject FRESH AIR control.

4 Front

Control Panel

a. Check for broken or damaged knobs. Insure that switches and controls move freely from position to position.

Paragraph

b. Reject any component that is found to be malfunctioning.

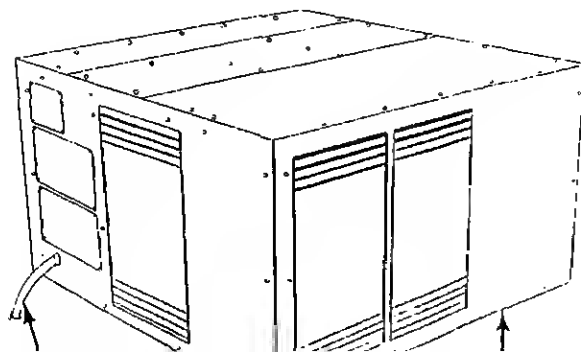
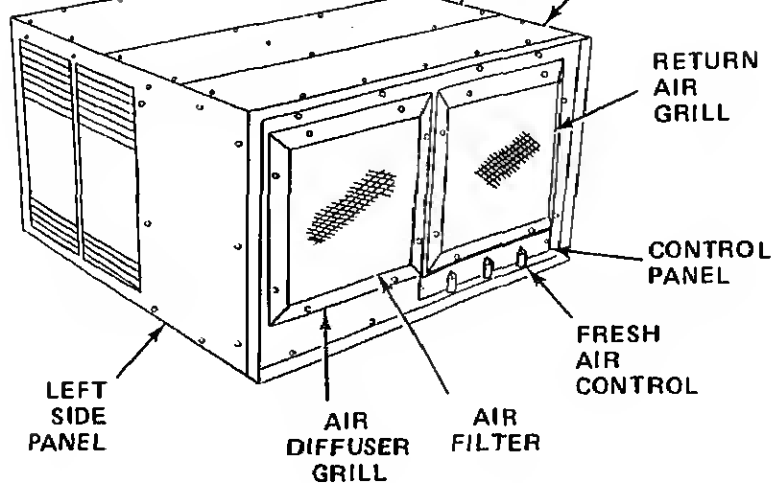
5 Right Side

Power Cable

a. Inspect power cable electrical connector for damage.

Paragraph

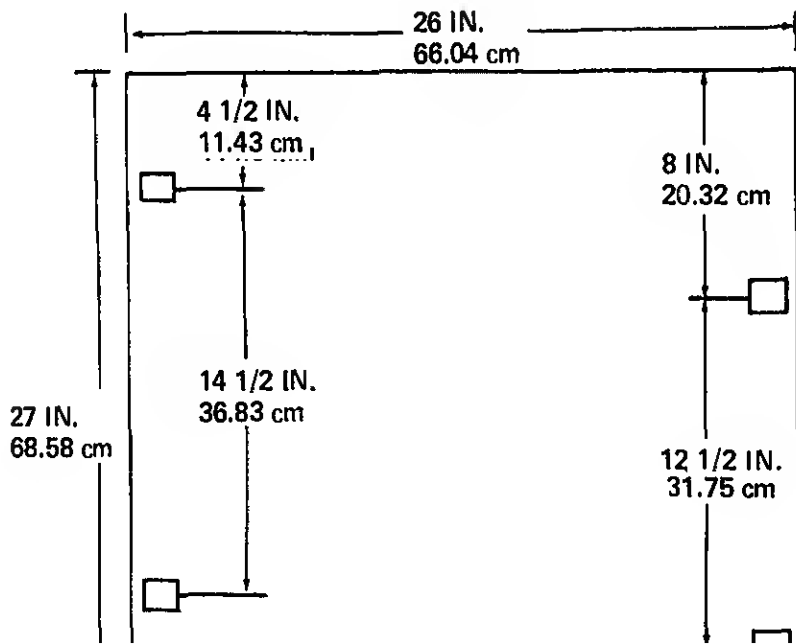
b. Repair or reject power cable.

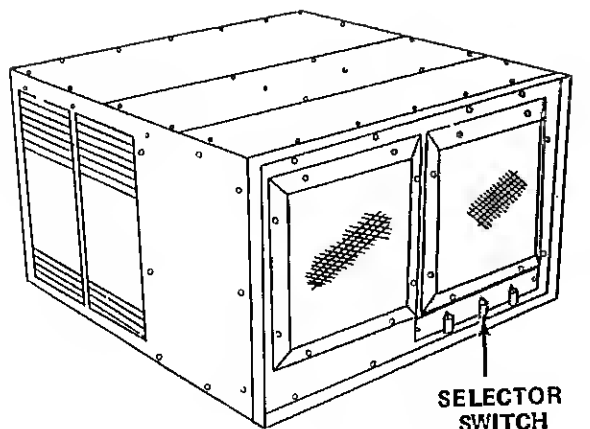


The total weight of the air conditioner is 153 pounds (69.40 kg.). Use a hand truck or fork lift to move the air conditioner. Do not exceed the (200 pounds (90.8 kg.)) capacity to unload the air conditioner. Keep the air conditioner upright during unloading. Pick a place that is as level as possible. Install the air conditioner in a van, shelter, or other structure through an opening 15 7/8 inches (40.3225 cm) high by 26 1/4 inches (66.675 cm) long. Make sure the air conditioner is installed so there is no restriction on the air flow, so that return air will have the greatest amount of warm air in the space to be cooled. Make sure that the control panel is accessible to the operator and maintenance personnel.

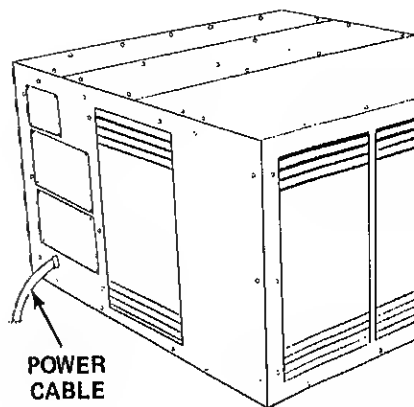
4-8. MOUNT THE UNIT

Brace the air conditioner with two (2) brackets to resist shock. Bolt the air conditioner to the structure using the four (4) threaded holes in the bottom of the air conditioner.



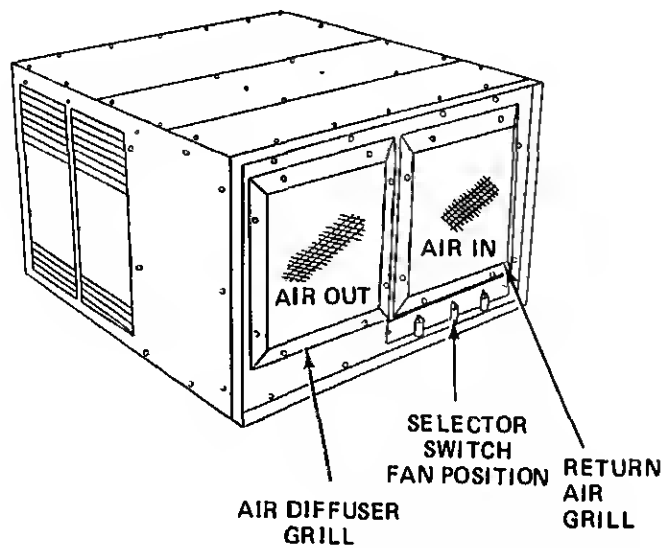


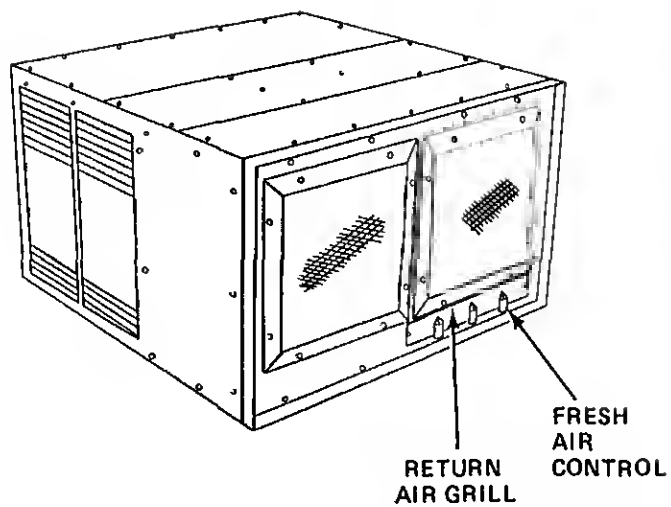
**SELECTOR
SWITCH
OFF POSITION**



**POWER
CABLE**

to see that air is sucked through the air return grill and air is blown out through the air discharge grill.





deficiencies and shortcomings shall be recorded together with the corrective action taken on D 2404 "Equipment Inspection and Maintenance Worksheet", at the earliest opportunity. If your equipment fails to operate, troubleshoot with proper equipment. Report any deficiencies using proper forms 38-750.

4-14. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

WARNING

Dry cleaning solvent, P-D-680, or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38°C).

WARNING

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

1



Air Filter

Remove twelve (12) screws securing air filter cover to bottom of air conditioner. Remove air filter cover and gasket.

Slide air filter down and out of air conditioner.

WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).

Clean air filter with P-D-680 or P-S-661 dry cleaning solvent or warm soapy water and dry with low-pressure compressed air.

Inspect air filter for damaged or clogged condition. Replace air filter if damage is indicated.

Inspect two (2) rubber pads on bottom of air filter for damage. Replace pads if damage is indicated. Secure pads with adhesive per specification MMM-A-121.

Dip or spray air filter with filter-kote or oil per specification MIL-L-2104 Grade 20, 30 or better. Drain off excessive oil before installation.

Slide air filter up into air conditioner.

Install gasket and air filter cover and secure with twelve (12) screws.

NOTE

For the following RMCS items, the air

housing. Remove right side panel.

Inspect fan motor for security of attachment.

Remove two (2) oil port caps and add SAE-20 oil every year. Replace oil port caps.

Align holes in right side panel with holes in housing.

Secure right side panel with seventeen (17) screws.

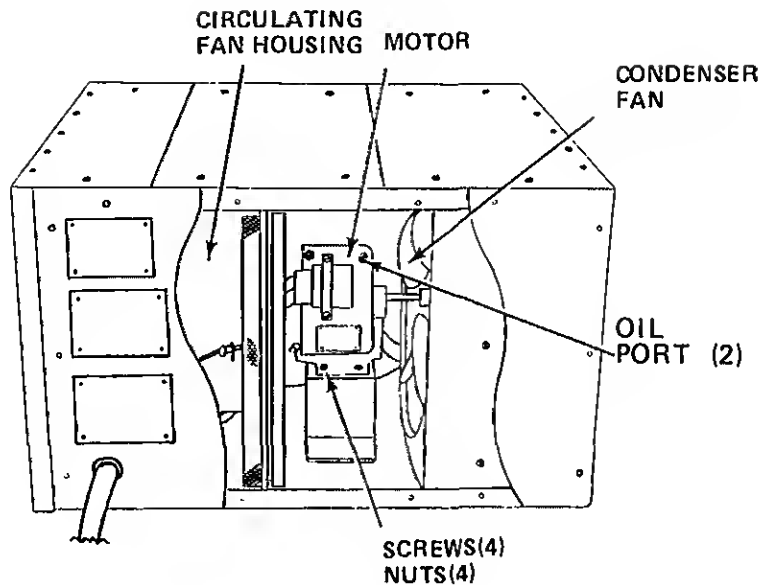
- Fans

Remove seventeen (17) screws securing right side panel to housing. Remove right side panel.

Inspect condenser fan for cleanliness and damage.

Inspect circulating fan for cleanliness and damage.

Secure right side panel with
seventeen (17) screws.



4

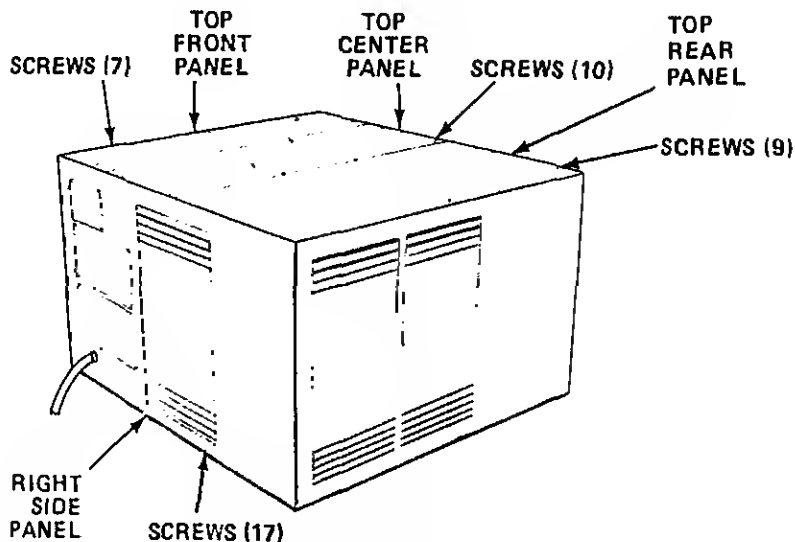
● Wiring

Remove ten (10) screws securing top center panel to housing. Remove top center panel.

Remove seven (7) screws securing top front panel to housing. Remove top front panel.

Remove nine (9) screws securing top rear panel to air conditioner housing. Remove top rear panel.

Remove seventeen (17) screws securing right side panel to housing. Remove right side panel.



4 ● Wiring (continued)

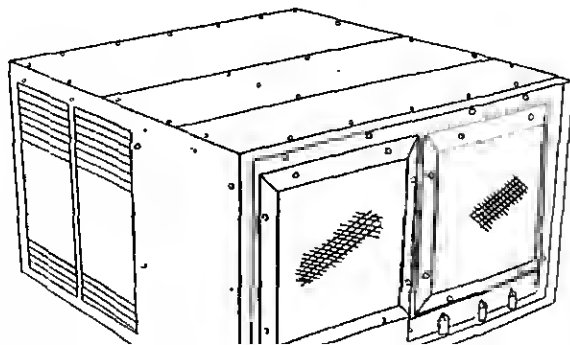
Remove seventeen (17) screws securing left side panel to housing. Remove left side panel.

Inspect wiring insulation for cracks and frayed material. Pay particular attention to the wires passing through holes in the frame or over rough edges.

Repair or replace damaged wiring.

Align holes in left side panel with holes in housing. Secure left side panel with seventeen (17) screws.

Align holes in right side panel with holes in housing. Secure right side panel with seventeen (17) screws.



top rear panel with nine (9) screws.

Align holes in top front panel with holes in housing. Secure top front panel with seven (7) screws.

Align holes in top center panel with holes in top front and top rear panels. Secure top center panel with ten (10) screws.

● Evaporator Coil

Remove eight (8) screws securing air diffuser grill to front panel. Remove air diffuser grill.

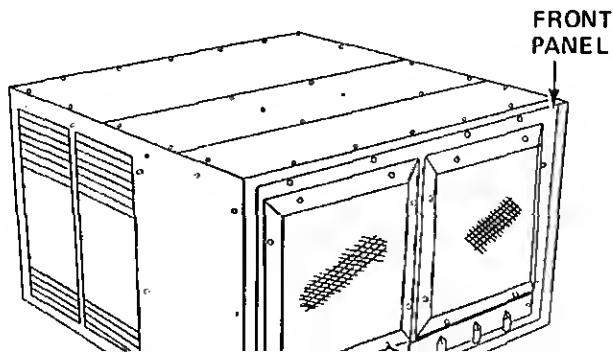
Remove screws (17) securing left side panel to housing. Remove left side panel.

Inspect evaporator coil for cleanliness. Use a stiff bristle brush to remove scale and corrosion from the external portion of the evaporator coil.

Inspect evaporator coil for leaks. Report damaged condition to direct support maintenance personnel.

Align holes in left side panel with holes in housing. Secure left side panel with seventeen (17) screws.

Align holes in air diffuser grill with holes in front panel. Secure air diffuser grill with eight (8) screws.



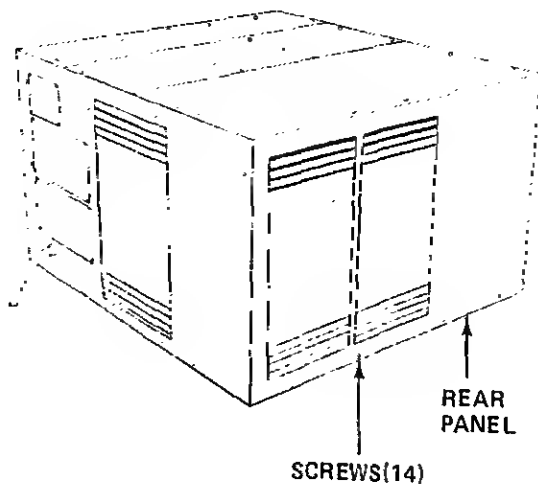
● Condenser Coil

Remove fourteen (14) screws securing rear panel to housing. Remove rear panel.

Inspect condenser coil for cleanliness. Use a stiff bristle brush to remove scale and corrosion from the external portion of the condenser coil.

Inspect condenser coil for leaks. Report damaged condition to direct support maintenance personnel.

Align holes in rear panel with holes in housing. Secure rear panel with fourteen (14) screws.



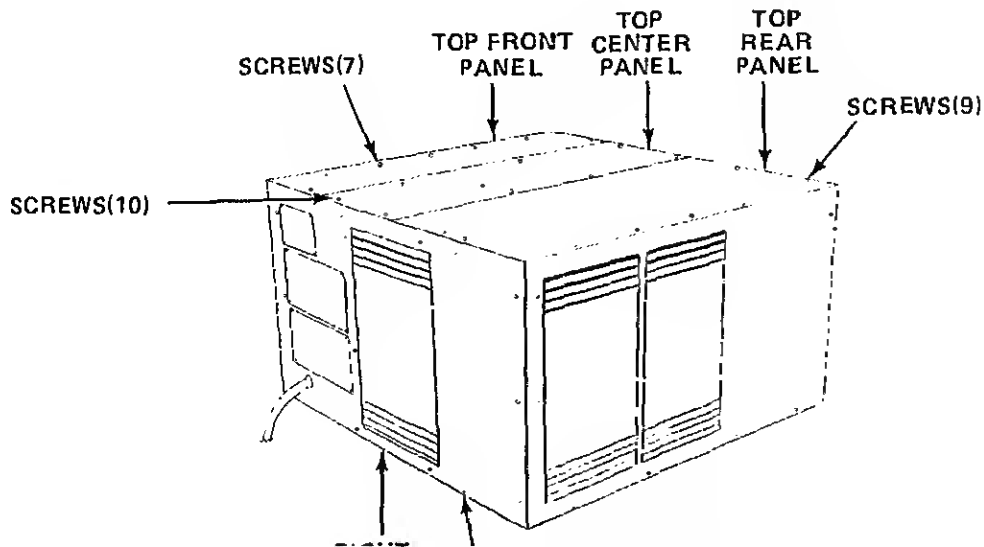
● Expansion Valve
and Refrigerant
Piping

Remove ten (10) screws
securing top center panel to
housing. Remove top center
panel.

Remove seven (7) screws
securing top front panel to
housing. Remove top front
panel.

Remove nine (9) screws securing
top rear panel to air
conditioner housing. Remove top
rear panel.

Remove seventeen (17) screws
securing right side panel to
housing. Remove right side
panel.



Item
No.

Interval
W Q

Item To Be
Inspected

Check For and Have Repaired
Or Adjusted As Necessary

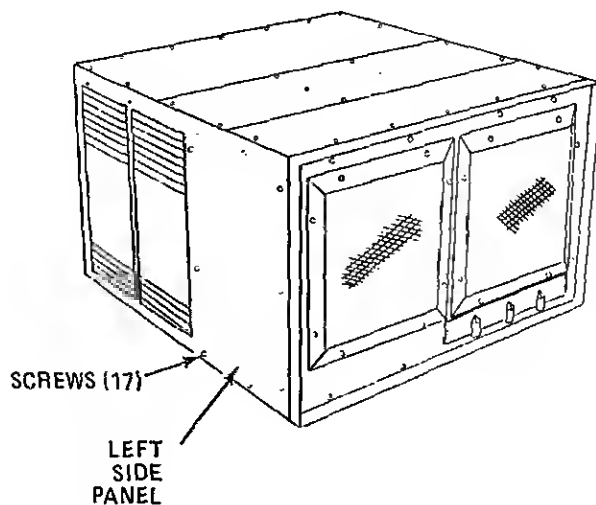
Equipment Is Not
Available If:

7



Expansion Valve
and Refrigerant
Piping (continued)

Remove seventeen (17) screws
securing left side panel to
housing. Remove left side
panel.



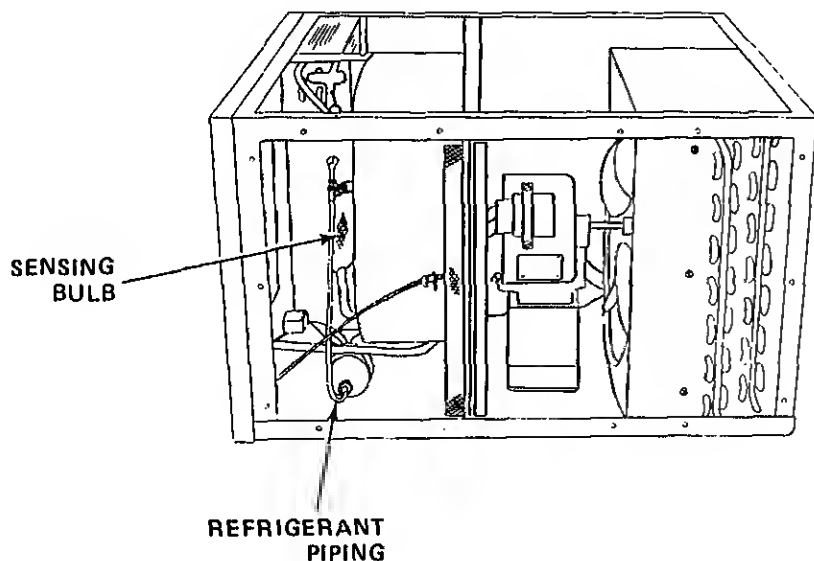
- 7
- Inspected
- Expansion Valve and Refrigerant Piping (continued)

Adjusted As Necessary

Inspect refrigerant piping for leaks. Repair leaks.

Inspect expansion valve for loose or leaking connections. Tighten connections.

Check to see that the sensing bulb is securely fastened and is completely covered with insulation tape part number 165 manufactured by Pressite Division, Inmont, Inc., St. Louis, MO.



with holes in housing. Secure left side panel with seventeen (17) screws.

Align holes in right side panel with holes in housing. Secure right side panel with seventeen (17) screws.

Align holes in top rear panel with holes in housing. Secure top rear panel with nine (9) screws.

Align holes in top front panel with holes in housing. Secure top front panel with seven (7) screws.

Align holes in top center panel with holes in top front and top rear panels. Secure top center panel with ten (10) screws.

NOTE

The sight glass may be inspected by looking through the louvers in the left side panel. If you cannot see the sight glass through the left side panel, then remove the rear panel.

remove rear panel.

With the air conditioner operating and providing cooling air, inspect sight glass.

Yellow appearance indicates moisture in system and bubbles or milky flow indicate low refrigerant charge.

Report presence of these conditions to direct support maintenance personnel.

Align holes in rear panel with holes in housing. Secure rear panel with fourteen (14) screws.

remedy the malfunction. You should perform the tests/inspections and corrective actions listed in the table.

b. This manual cannot list all malfunctions that may occur; nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

ORGANIZATIONAL TROUBLESHOOTING TABLE

Malfunction	Test or Inspection	Corrective Action
-------------	--------------------	-------------------

AIR CONDITIONER

AIR CONDITIONER FAILS TO OPERATE

- Step 1.* Check to see if main power cord is plugged in.
Connect power cable to receptacle supplying 115 VAC, single phase, 60 Hz power.
- Step 2.* Check to see if power receptacle connector is defective.
Replace defective power receptacle connector (para. 4-29).
- Step 3.* Check for loose electrical connections.
Tighten electrical connections.
- Step 4.* Inspect for defective wiring.
Replace defective wiring. Use identical type wire, consult Appendix F, and secure terminal connections (para. 4-29).
- Step 5.* Check the selector switch.
a. Observe position of the switch. Be sure switch is NOT in the OFF position.
b. Rotate the switch through all operating positions. If the air conditioner does not operate in some but not all operating positions, check for a defective switch with a multimeter.
Replace defective switch (para. 4-23).

INSUFFICIENT COOLING

- Step 1.* Inspect sight glass for proper amount of refrigerant (para. 4-34).
Report condition to direct support maintenance personnel.
- Step 2.* Check for dirty air filter.
Clean or replace air filter (para. 4-19).
- Step 3.* Inspect evaporator coil for cleanliness.
Clean evaporator coil (para. 4-32).
- Step 4.* Check compressor for proper operation (para. 4-30).
Report condition to direct support maintenance personnel.
- Step 5.* Inspect for closed, bent or stuck louvers in the return air grill.
Open louvers, straighten bent louvers or replace damaged return air grill (para. 4-18).
- Step 6.* Check to see that circulating fan is securely mounted on motor shaft and that there is no indication of damage to circulating fan.

- Tighten setscrews in hub of condenser fan and any other loose mounting hardware or replace damaged condenser fan (para. 4-21).
- 3. Inspect fan motor for wear and damage.
- 4. Replace damaged fan motor (para. 4-20).
- Check to see if compressor is knocking or chattering.
- Stop air conditioner and report condition to direct support maintenance personnel.

FANS

CIRCULATING FAN FAILS TO OPERATE

- 1. Check to see if main power cord is plugged in.
Connect power cord to receptacle supplying 115 VAC, single phase, 60 Hz power.
- 2. Test fan motor for resistance.
Consult Appendix F and replace fan motor if damage is indicated (para. 4-20).
- 3. Check circulating fan for damage or binding.
Relieve binding or replace damaged circulating fan (para. 4-22).
- 4. Test fan motor capacitor for continuity, leakage and capacitance.
Replace capacitor if damage is indicated (para. 4-25).

CONDENSER FAN FAILS TO OPERATE

- 1. Check to see if main power cord is plugged in.
Connect power cord to receptacle supplying 115 VAC, single phase, 60 Hz power.
- 2. Test fan motor for resistance.
Consult Appendix F and replace fan motor if damage is indicated (para. 4-20).
- 3. Check condenser fan for damage or binding.
Relieve binding or replace damaged circulating fan (para. 4-21).
- 4. Test fan motor capacitor for continuity, leakage and capacitance.
Replace capacitor if damage is indicated (para. 4-25).

COMPRESSOR

COMPRESSOR WILL NOT START

- 1. Check the selector switch.
 - a. Observe position of the switch. Be sure switch is NOT in the OFF or FAN positions.
 - b. Place the switch in the COOL position. If the air conditioner will not operate in the COOL position, check for a defective switch using a multimeter.
Replace defective switch (para. 4-23).
- 2. Check the THERMOSTAT.
 - a. Observe position of the THERMOSTAT. Be sure THERMOSTAT is in the COOLER position.
 - b. Rotate THERMOSTAT to the COOLER position. If the compressor will not start, check for a defective THERMOSTAT using a multimeter.

- Step 2.* Test fan motor.
Consult Appendix F and replace fan motor if damage is indicated (para. 4-20).
- Step 3.* Check expansion valve for proper operation and damage (para. 4-33).
Report condition to direct support maintenance personnel.
- Step 4.* Check compressor for proper operation and damage (para. 4-30).
Report condition to direct support maintenance personnel.

AIR OUTPUT

1. EVAPORATOR AIR OUTPUT VOLUME LOW

- Step 1.* Inspect return air and air diffuser grills for damage and cleanliness.
Clean, repair or replace return air and air diffuser grills (para. 4-18).
- Step 2.* Inspect evaporator coil for damage, ice and cleanliness.
Clean evaporator coil (para. 4-32). Report damaged condition to direct support maintenance personnel.
- Step 3.* Inspect circulating fan for security of attachment and damage.
Tighten setscrews in hub of circulating fan, replace fan if damage is indicated (para. 4-20).
- Step 4.* Test fan motor for resistance.
Consult Appendix F and replace fan motor if damage is indicated (para. 4-20).

2. CONDENSER AIR OUTPUT VOLUME LOW

- Step 1.* Inspect condenser coil for cleanliness or damage.
Clean condenser coil (para. 4-33). Report damaged condition to direct support maintenance personnel.
- Step 2.* Test thermostat for resistance.
Replace defective thermostat (para. 4-24).
- Step 3.* Inspect condenser fan for security of attachment and damage.
Tighten setscrews in hub of condenser fan, replace fan if damage is indicated (para. 4-20).
- Step 4.* Test fan motor for resistance.
Consult Appendix F and replace fan motor if damage is indicated (para. 4-20).
-

	Para	Page
er	4-19	4-34
ting Fan	4-22	4-48
essor	4-30	4-73
user Coil	4-33	4-83
user Fan	4-21	4-41
ator Coil	4-32	4-80
ion Valve	4-35	4-87
otor	4-20	4-34
	4-17	4-25
g Panels and Grills	4-18	4-26
Capacitor	4-25	4-61
rant Piping	4-31	4-74
pacitor	4-27	4-65
r Switch	4-23	4-53
lass	4-34	4-85
apacitor	4-26	4-63
elay	4-28	4-67
ostat Switch	4-24	4-57
	4-29	4-70

Information pertains to all procedures for organizational maintenance personnel.

Configurations

Special Environmental Conditions

None

ment

ts

Required

Organizational Maintenance

General Safety Instructions

Disconnect the power source before performing any maintenance function. Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

INITIAL SETUP

Material/Parts

Top Center Panel Screws (10)
 Top Front Panel Screws (7)
 Top Rear Panel Screws (9)
 Right Side Panel Screws (17)
 Rear Panel Screws (14)
 Return Air Grill Screws (8)
 Air Diffuser Grill Screws (8)
 Control Panel Plate Screws (2)
 Front Panel Screws (14)
 Adhesive

References

None

Troubleshooting Reference

None

Approximate Time Required (in minutes)

Removal	30
Repair	30
Installation	30
TOTAL TIME	90

LOCATION/ITEM

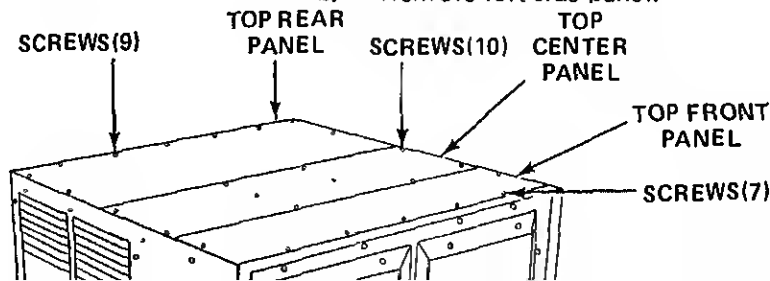
REMARKS

ACTION

REMOVAL

TOP AND LEFT SIDE OF HOUSING

1. Top Center Panel
 - a. Remove ten (10) screws securing panel.
 - b. Remove top center panel.
2. Top Front Panel
 - a. Remove seven (7) screws securing panel.
 - b. Remove top front panel.
3. Top Rear Panel
 - a. Remove nine (9) screws securing panel.
 - b. Remove top rear panel.
4. Left Side Panel
 - a. Remove seventeen (17) screws securing side panel.
 - b. Remove left side panel.

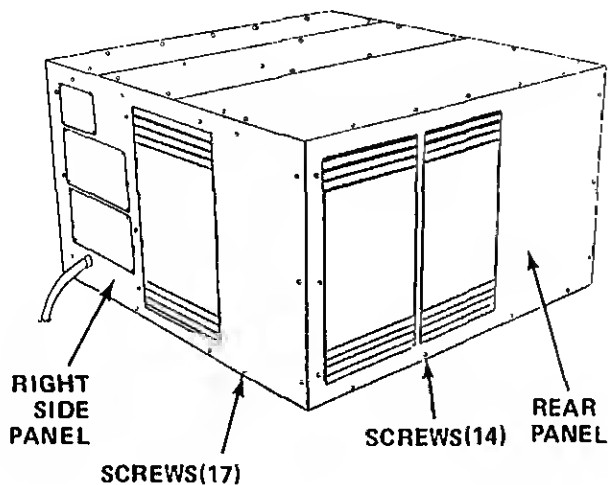


SIDE AND REAR OF HOUSING

Right Side Panel

Panel

- a.* Remove seventeen (17) screws securing right side panel.
 - b.* Remove right side panel.
-
- a.* Remove fourteen (14) screws securing rear panel.
 - b.* Remove rear panel.



AL

OF HOUSING

Turn Air Grill

- a.* Loosen mechanical screw post at rear of

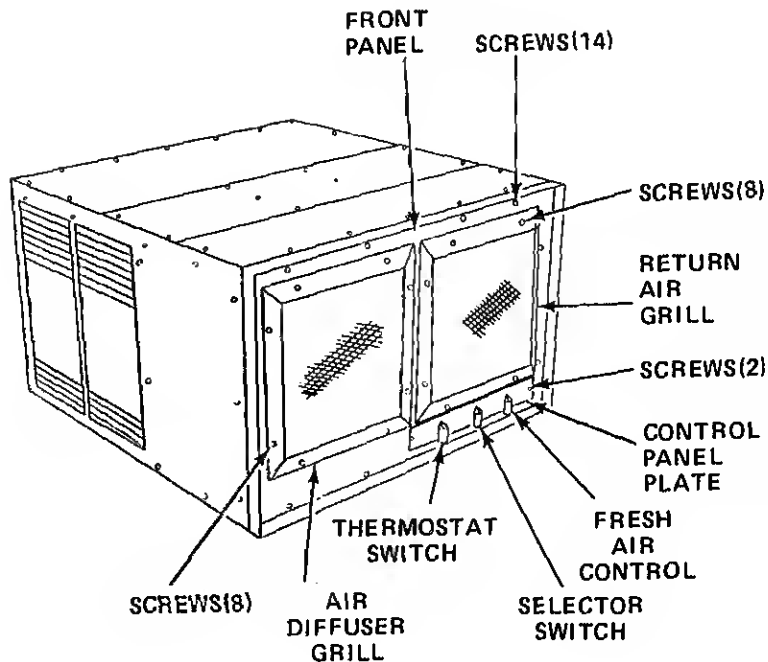
10. Front Panel

c. Remove control panel plate.

a. Remove two (2) screws securing switch to front panel.

b. Remove fourteen (14) screws securing front panel.

c. Remove front panel.



Front and Rear Panels

- a. Inspect self-locking plate nuts for damage.
- b. Drill out blind rivets, then rivet new nut to top front panel.
- c. Inspect panels for distortion or loose gasket.
- d. Secure loose gasket with adhesive per specification MMM-A-121.
- e. Replace gasket with .062 inch thick wool felt per specification MIL-G-20241. Secure gasket with adhesive per specification MMM-A-121.

Center Panel

- a. Inspect panel for distortion.
- b. Straighten or replace damaged panel.

Repair consists of straightening bent louvers.

ATION

F HOUSING

Panel

- a. Align holes in thermostat switch with holes in front panel.
- b. Secure thermostat switch to front panel with two (2) screws.
- c. Align holes in front panel with holes in housing.
- d. Secure front panel with fourteen (14) screws.

Control Panel Plate

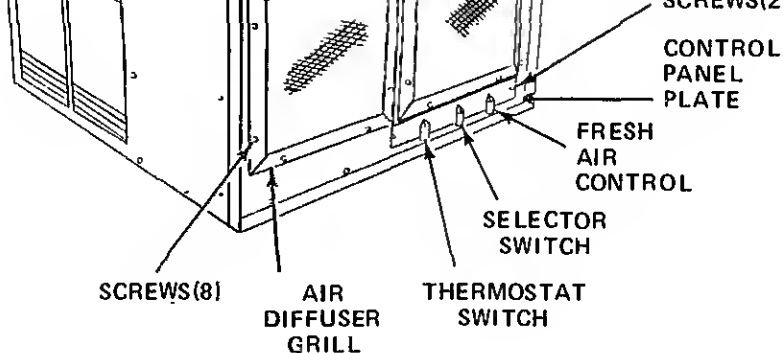
- a. Align holes in control panel plate with holes in front panel.
- b. Secure control panel plate with two (2) screws.
- c. Install three (3) knobs.

Air Diffuser Grill

- a. Align holes in air diffuser grill with holes in front panel.
- b. Secure air diffuser grill with eight (8) screws.

Return Air Grill

- a. Align holes in return air grill with holes in front panel.
- b. Secure return air grill with eight (8) screws.
- c. Install wire in mechanical screw post and tighten mechanical screw post.



LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

INSTALLATION

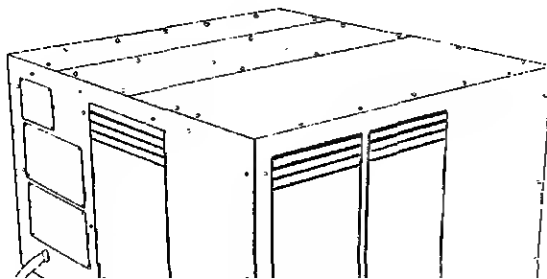
RIGHT SIDE AND REAR OF HOUSING

Rear Panel

- Align holes in rear panel with holes in housing.
- Secure rear panel with fourteen (14) screws.

Right Side Panel

- Align holes in right side panel with holes in housing.
- Secure right side panel with seventeen (17) screws.



e Panel

a. Align holes in left side panel with holes in housing.

b. Secure left side panel with seventeen (17) screws.

ar Panel

a. Align holes in top rear panel with holes in housing.

b. Secure top rear panel with nine (9) screws.

nt Panel

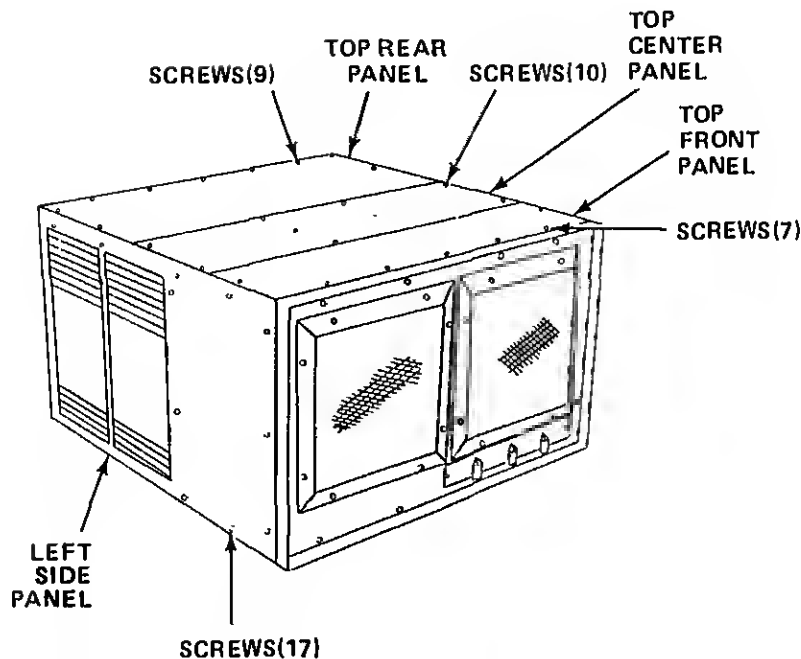
a. Align holes in top front panel with holes in housing.

b. Secure top front panel with seven (7) screws.

ter Panel

a. Align holes in top center panel with holes in top front and top rear panels.

b. Secure top center panel with ten (10) screws.



- a. Removal
- b. Inspection

- c. Service
- d. Installation

INITIAL SETUP

Material/Parts

Air Filter Cover Screws (12)
Dry Cleaning Solvent
Filterkote or Oil

References

None

Troubleshooting Reference

AIR CONDITIONER, Malfunction 2

Approximate Time Required (in minutes)

Removal	10
Inspection and Service	10
Installation	10
TOTAL TIME	30

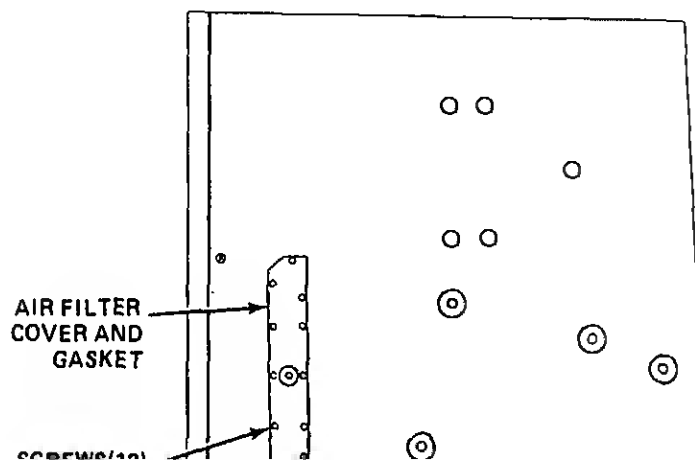
LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL

BOTTOM OF HOUSING

1. Air Filter

- a. Remove twelve (12) screws securing cover to bottom of air conditioner.
- b. Remove air filter cover and gasket.
- c. Slide air filter down and out of conditioner.



Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).

WARNING

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

- a.* Clean air with P-D-680 or P-S-661 dry cleaning solvent or warm soapy water.
- b.* Dry air filter with low pressure compressed air.
- c.* Inspect air filter for damaged or clogged condition.
- d.* Replace air filter if damage is indicated.
- e.* Inspect two (2) rubber pads on bottom of air filter for damaged condition.
- f.* Replace pads with a 2-inch long piece of rubber in accordance with ASTM D2000-2BG505F17L14.
- g.* Secure pads with adhesive per specification MMM-A-121.
- h.* Dip or spray air filter with filterkote or oil per specification MIL-L-2104 Grade 20, 30 or better.
- i.* Drain off excess oil before installation.

ATION

OF HOUSING

- a.* Slide air filter up into air conditioner.
- b.* Install gasket and air filter cover.
- c.* Secure air filter cover with twelve (12) screws.

Return Air Grill Screws (8)
 Air Diffuser Grill Screws (8)
 Control Panel Plate Screws (2)
 Front Panel Screws (14)
 Blower Intake Ring Screws (7)
 Fan Motor Capscrews (4)
 Fan Motor Self-Locking Nuts (4)
 Thermostat Switch Screws (2)

References
 None

AIR OUTPUT, Malfunction 1,
 AIR OUTPUT, Malfunction 2,
 NOISE, Malfunction 1, Step 3

Approximate Time Required (in minutes)
 Removal
 Inspection and Testing
 Repair
 Installation
 TOTAL TIME

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL

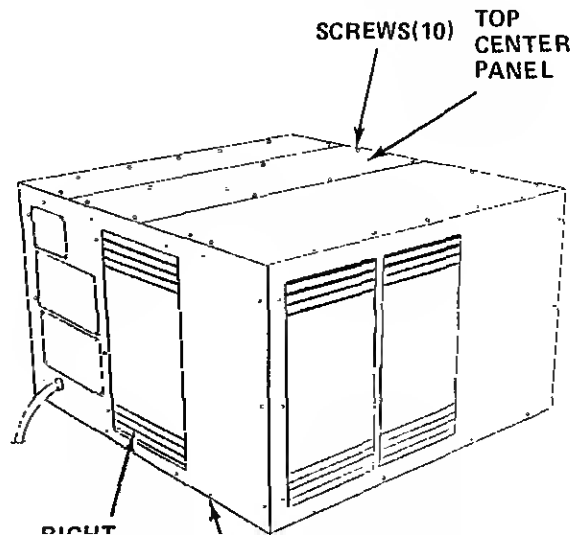
RIGHT SIDE AND TOP OF HOUSING

1. Right Side Panel

- Remove seventeen (17) screws from right side panel.
- Remove right side panel.

2. Top Center Panel

- Remove ten (10) screws securing top center panel.
- Remove top center panel.



Grill

- a. Loosen mechanical screw post at rear of return air grill and remove wire.
- b. Remove eight (8) screws securing return air grill.
- c. Remove return air grill.

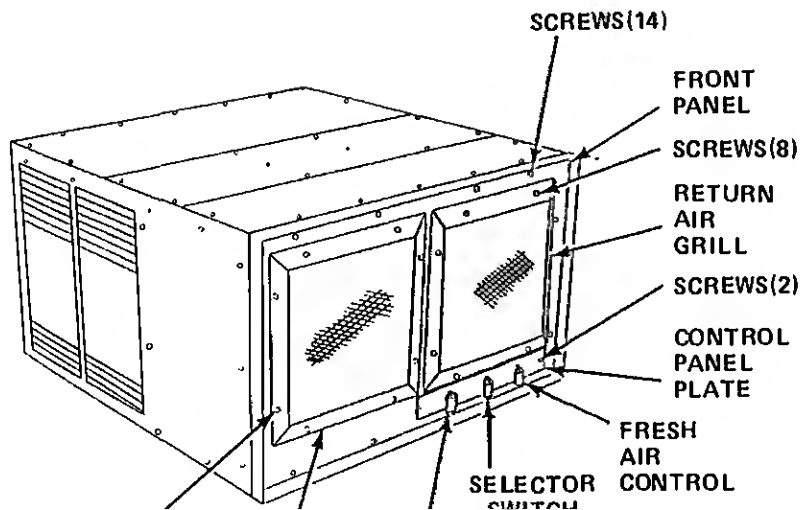
Grill

- a. Remove eight (8) screws securing air diffuser grill.
- b. Remove air diffuser grill.

Panel Plate

- a. Loosen setscrews and remove knobs from fresh air control, selector switch and thermostat switch.
- b. Remove two (2) screws securing control panel plate.
- c. Remove control panel plate.

- a. Remove two (2) screws securing thermostat switch to front panel.
- b. Remove fourteen (14) screws securing front panel.
- c. Remove front panel.



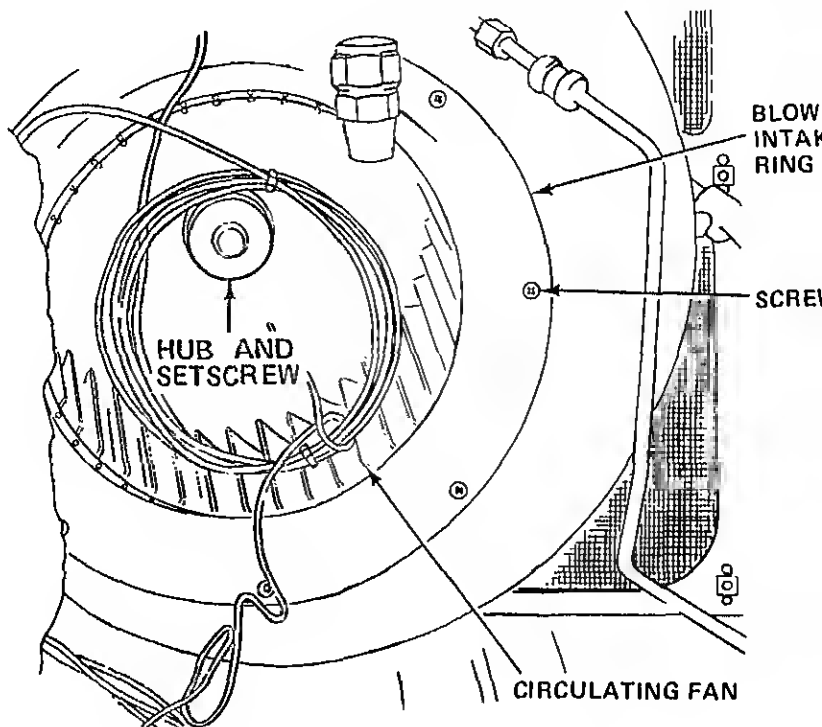
REMOVAL**FRONT OF HOUSING**

7. Blower Intake Ring

- a. Remove seven (7) screws securing intake ring.
b. Remove blower intake ring.

8. Circulating Fan

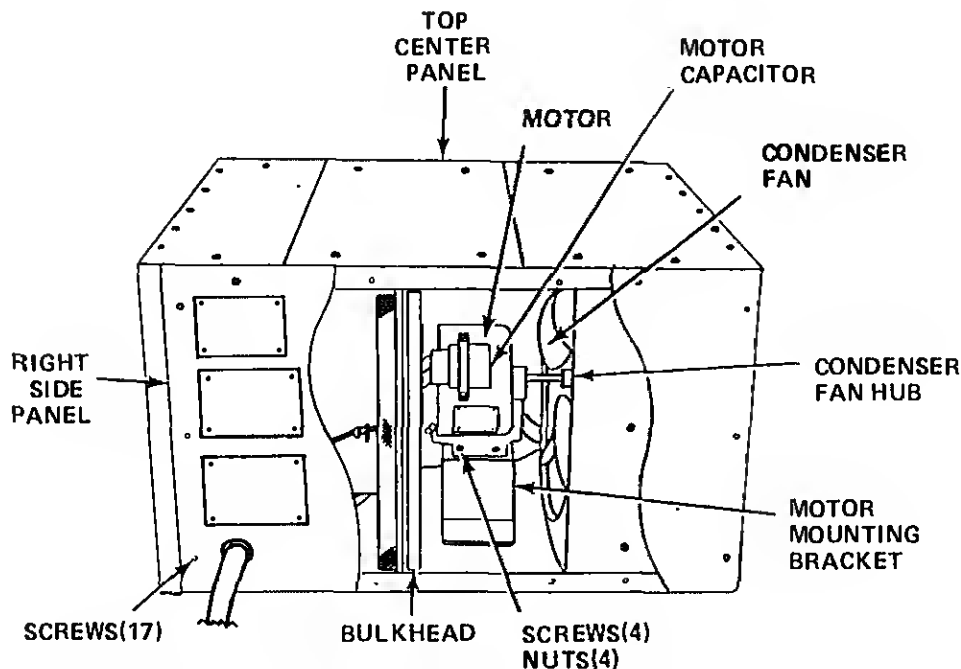
- a. Loosen setscrew in hub of circulating fan.
b. Carefully remove circulating fan.



WARNING

Death or serious injury may occur if capacitor is not discharged prior to removal.

- a. Remove upper four (4) capscrews and self-locking nuts securing motor to motor mounting bracket.
- b. Slide motor back against bulkhead.
- c. Loosen setscrew in hub of condenser fan.
- d. Remove condenser fan.
- e. Discharge motor capacitor.
- f. Tag and disconnect electrical leads to motor capacitor.
- g. Tag and disconnect leads to fan motor.
- h. Remove fan motor from housing.



- d. Replace motor if there is NO re

REPAIR

11. Fan Motor

Repair electrical wiring as follows:

- (1) Remove insulation to exp
 - (2) Twist the wire ends toge
 - (3) Cover the splice with
- tape, making certain to co
- areas.

INSTALLATION

12. Fan Motor

- a. Connect electrical leads to m
- b. Connect electrical leads to
- c. Place fan motor on motor mo
- d. Slide fan motor back against b

INSTALLATION

RIGHT SIDE OF HOUSING

13. Condenser Fan

- a. Install condenser fan on fan m
- b. Tighten setscrew in condenser

FRONT OF HOUSING

14. Circulating Fan

- a. Carefully install circulating fa
- b. Tighten setscrew in circulating

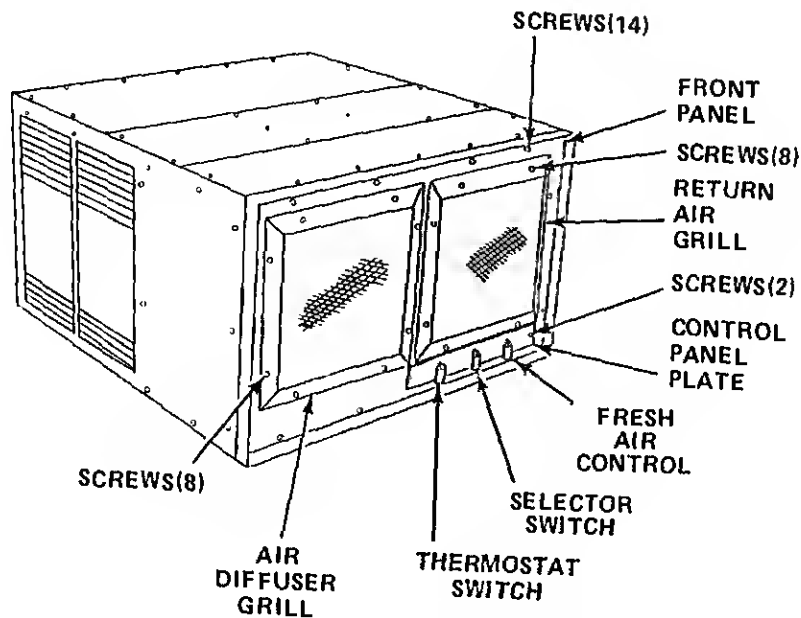
15. Blower Intake Ring

- a. Align holes in blower intake r
 - b. Secure blower intake ring
- screws.

16. Front Panel

- a. Align holes in thermostat swi
 - b. Secure thermostat switch to
 - c. Align holes in front panel
- housing.

- a. Align holes in control panel plate with holes in front panel.
 - b. Secure control panel plate with two (2) screws.
 - c. Install three (3) knobs on fresh air control, selector switch, and thermostat switch.
-
- a. Align holes in air diffuser grill with holes in front panel.
 - b. Secure air diffuser grill with eight (8) screws.
-
- a. Align holes in return air grill with holes in front panel.
 - b. Secure return air grill with eight (8) screws.
 - c. Install wire in mechanical screw post and tighten mechanical screw post.



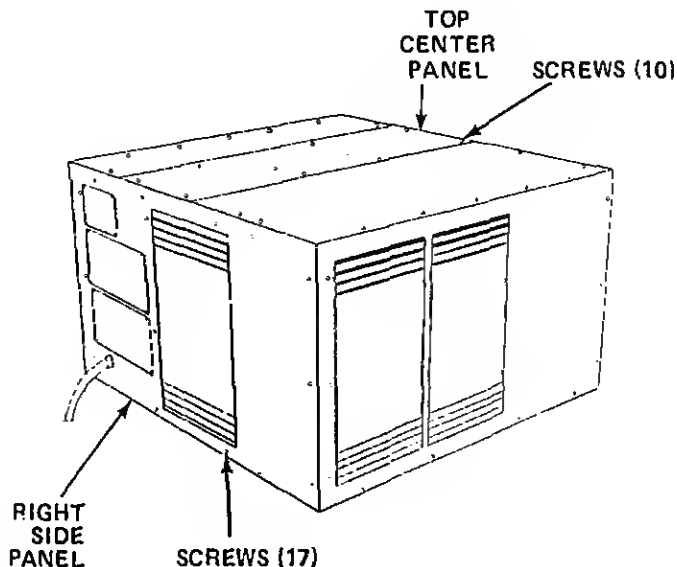
RIGHT SIDE AND TOP OF HOUSING

20. Top Center Panel

- a Align holes in top center panel with top rear and top front panels.
- b Secure top center panel with ten

21. Right Side Panel

- a Align holes in right side panel with housing.
- b Secure right side panel with seven screws.



d. Installation

UP
Parts
t Side Panel Screws (17)
Center Panel Screws (10)
rn Air Grill Screws (8)
Diffuser Grill Screws (8)
ontrol Panel Plate Screws (2)
t Panel Screws (14)
ver Intake Ring Screws (7)
Motor Capscrews (4)
Motor Self-Locking Nuts (4)
rmostat Switch Screws (2)
s
e

Troubleshooting Reference

FANS, Malfunction 1, Step 3
AIR OUTPUT, Malfunction 2, Step 3
NOISE, Malfunction 1, Step 2

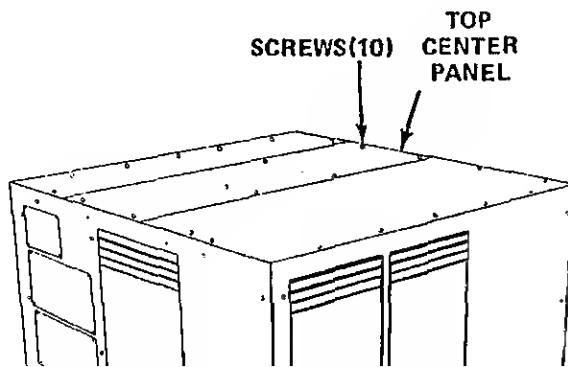
Approximate Time Required (in minutes)

Removal	30
Inspection and Repair	20
Installation	30
TOTAL TIME	80

ON/ITEM	REMARKS	ACTION
---------	---------	--------

AND TOP OF HOUSING

- | | |
|-------|--|
| Panel | <p>a. Remove seventeen (17) screws securing right side panel.</p> <p>b. Remove right side panel.</p> |
| Panel | <p>a. Remove ten (10) screws securing top center panel.</p> <p>b. Remove top center panel.</p> |



3. Return Air Grill

- a. Loosen mechanical screw posts on return air grill and remove wire.
- b. Remove eight (8) screws securing grill.
- c. Remove return air grill.

4. Air Diffuser Grill

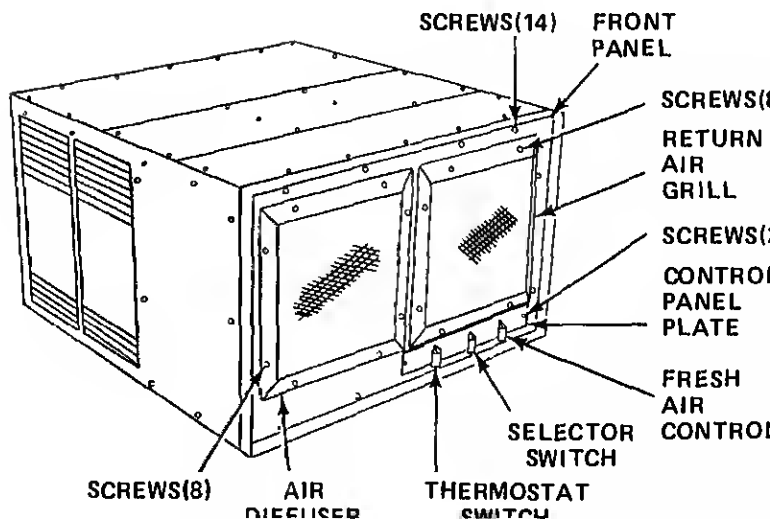
- a. Remove eight (8) screws securing grill.
- b. Remove air diffuser grill.

5. Control Panel Plate

- a. Loosen setscrews and remove fresh air control, selector thermostat switch.
- b. Remove two (2) screws securing plate.
- c. Remove control panel plate.

6. Front Panel

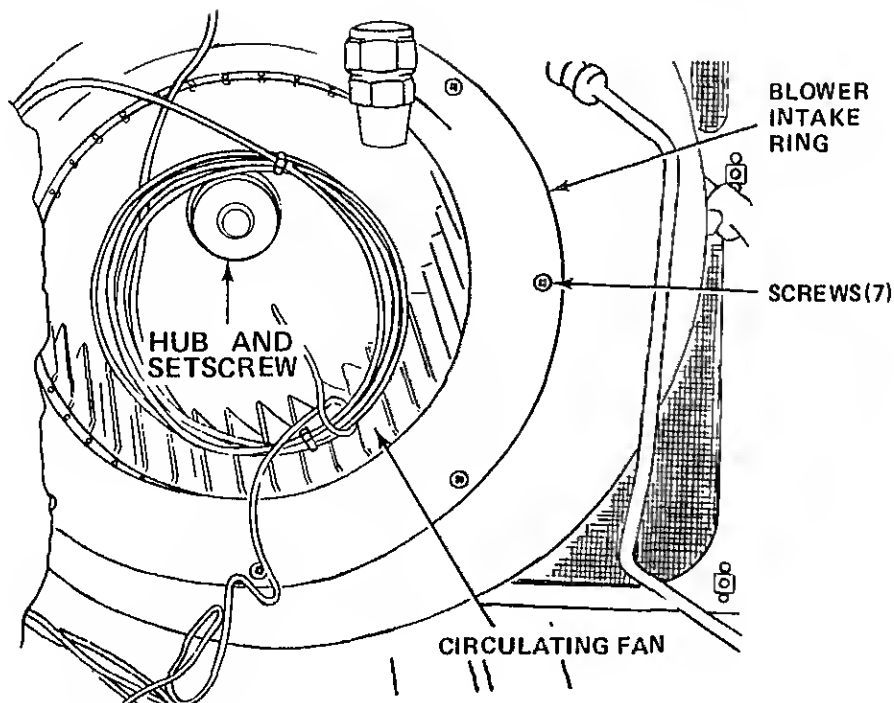
- a. Remove two (2) screws securing switch to front panel.
- b. Remove fourteen (14) screws securing front panel.
- c. Remove front panel.



ke Ring

Fan

- a. Remove seven (7) screws securing blower intake ring.
- b. Remove blower intake ring.
- a. Loosen setscrew in hub of circulating fan.
- b. Carefully remove circulating fan.

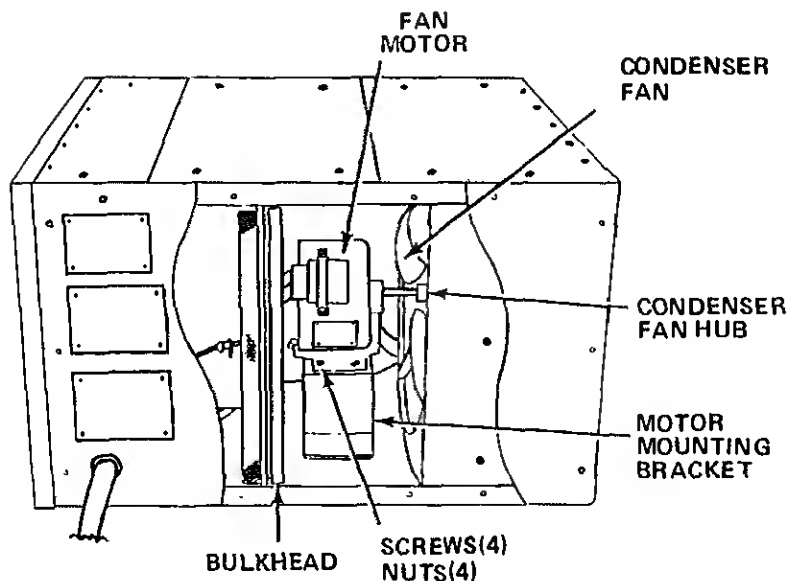


INSTALLATION

11. Condenser Fan

- b. Replace condenser fan if damage to h
condenser fan is indicated.
- c. Replace setscrew with a 1/4-28UNF-
.312 inch long setscrew if damage is indi

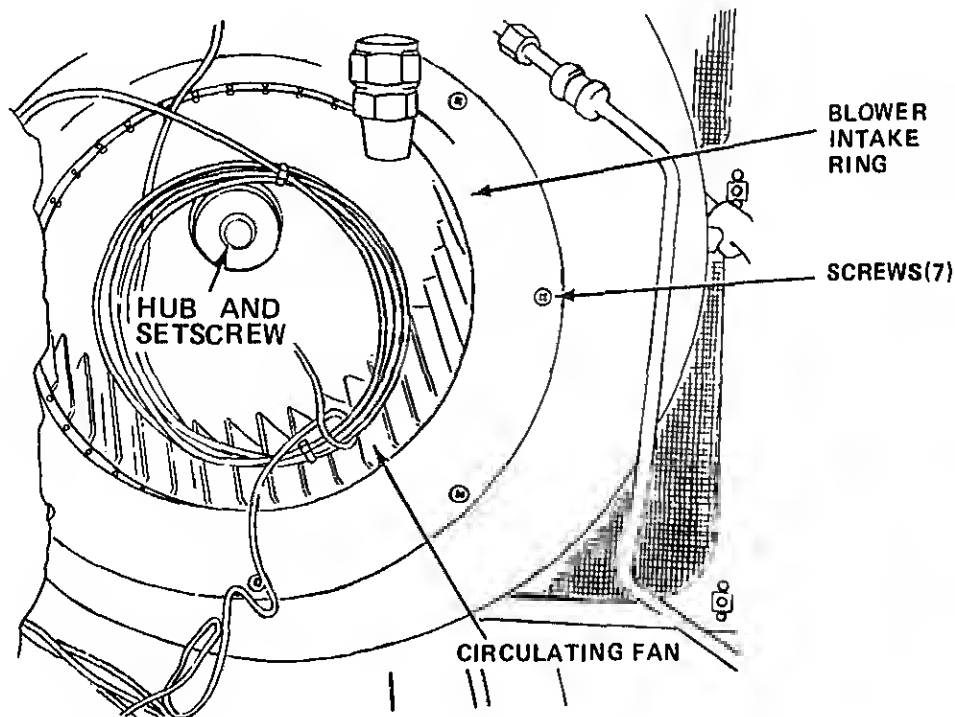
- a. Install condenser fan on fan motor shaft
- b. Tighten setscrew in condenser fan hub.
- c. Slide fan motor back into place on
mounting bracket.
- d. Secure fan motor to motor mounting b
with four (4) capscrews and self-locking



circulating fan

Blower Intake Ring

- a. Carefully install circulating fan on fan shaft.
- b. Tighten setscrew in circulating fan hub.
- a. Align holes in blower intake ring with holes in circulating fan housing.
- b. Secure blower intake ring with seven screws.



14. Front Panel

- a. Align holes in thermostat switch with holes in front panel.
- b. Secure thermostat switch to front panel with two (2) screws.
- c. Align holes in front panel with holes in housing.
- d. Secure front panel with fourteen (14) screws.

15. Control Panel Plate

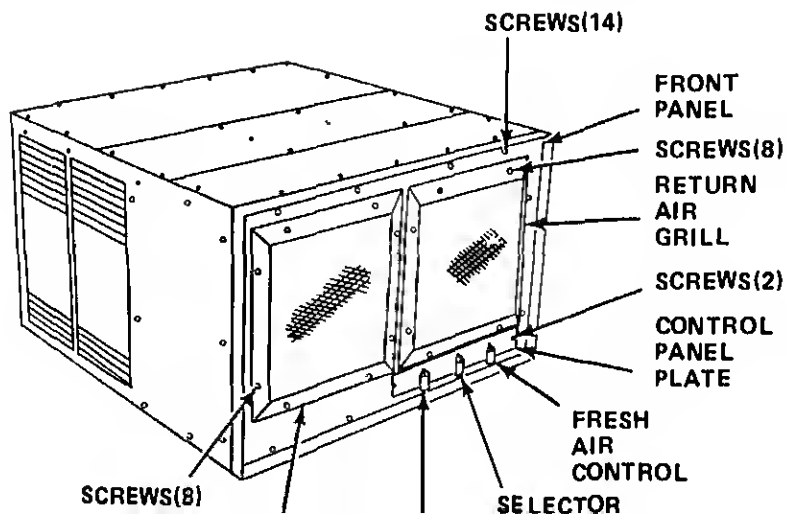
- a. Align holes in control panel plate with holes in front panel.
- b. Secure control panel plate with two (2) screws.
- c. Install three (3) knobs on fresh air control selector switch and thermostat switch.

16. Air Diffuser Grill

- a. Align holes in air diffuser grill with holes in front panel.
- b. Secure air diffuser grill with eight (8) screws.

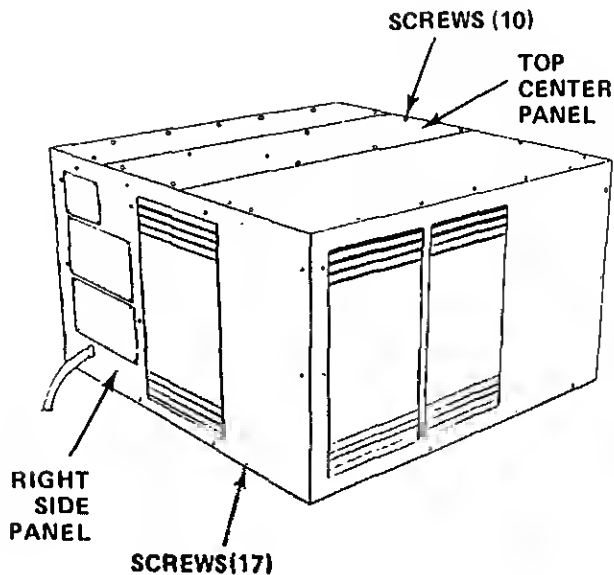
17. Return Air Grill

- a. Align holes in return air grill with holes in front panel.
- b. Secure return air grill with eight (8) screws.
- c. Install wire in mechanical screw post to tighten mechanical screw post.



19. Right Side Panel

- b.* Secure top center panel with ten (10)
- a.* Align holes in right side panel with housing.
- b.* Secure right side panel with seven screws.



INITIAL SETUP

Material/Parts

Right Side Panel Screws (17)
Top Center Panel Screws (10)
Return Air Grill Screws (8)
Air Diffuser Grill Screws (8)
Control Panel Plate Screws (8)
Front Panel Screws (14)
Blower Intake Ring Screws (7)
Fan Motor Capscrews (4)
Fan Motor Self-Locking Nuts (4)
Thermostat Switch Screws (2)

References

None

Troubleshooting Reference

AIR CONDITIONER, Malfunction
FANS, Malfunction 1, Step 3
AIR OUTPUT, Malfunction 1, Step
NOISE, Malfunction 1, Step 1

Approximate Time Required (in minutes)

Removal	30
Inspection and Repair	20
Installation	30
TOTAL TIME	80

LOCATION/ITEM

REMARKS

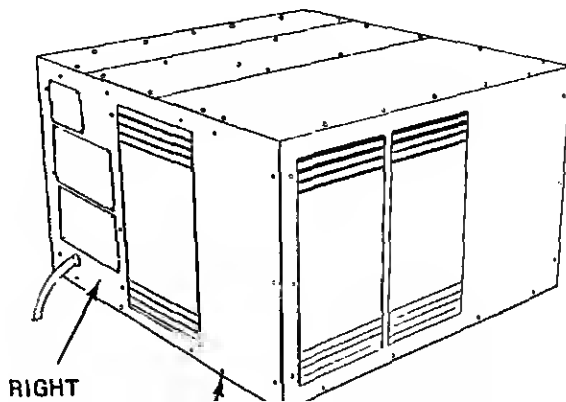
ACTION

REMOVAL

RIGHT SIDE OF HOUSING

1. Right Side Panel

- Remove seventeen (17) screws se side panel.
- Remove right side panel.



Return Air Grill

- a. Loosen mechanical screw post at rear return air grill and remove wire.
- b. Remove eight (8) screws securing return grill.
- c. Remove return air grill.

Air Diffuser Grill

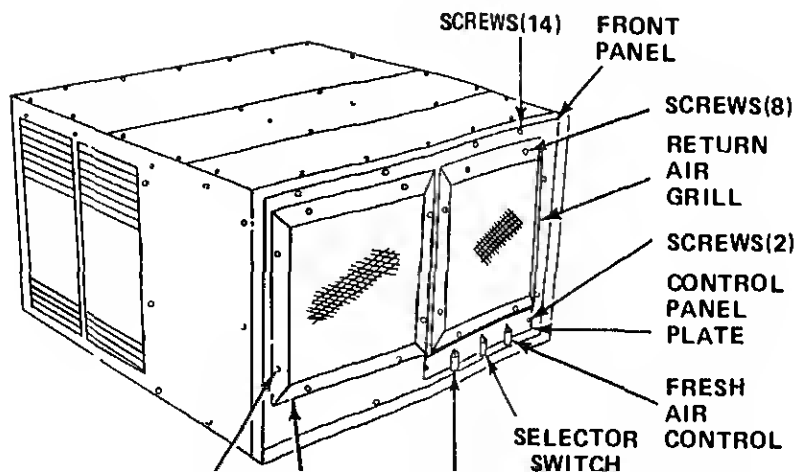
- a. Remove eight (8) screws securing air diffuser grill.
- b. Remove air diffuser grill.

Control Panel Plate

- a. Loosen setscrews and remove knobs for fresh air control, selector switch and thermostat switch.
- b. Remove two (2) screws securing control panel plate.
- c. Remove control panel plate.

Front Panel

- a. Remove two (2) screws securing thermostat switch to front panel.
- b. Remove fourteen (14) screws securing front panel.
- c. Remove front panel.



7. Circulating Fan

INSPECTION AND REPAIR

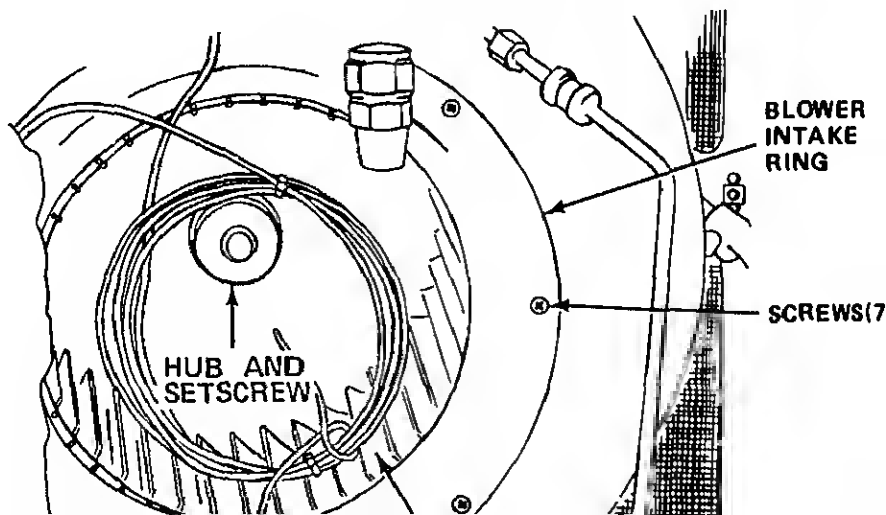
8. Circulating Fan

INSTALLATION

9. Circulating Fan

10. Blower Intake Ring

- intake ring.
- Remove blower intake ring.
 - Loosen setscrew in hub of circulating fan.
 - Carefully remove circulating fan.
 - Inspect circulating fan, hub and setscrew for indication of excessive wear or damage.
 - Replace circulating fan if damage to circulating fan is indicated.
 - Replace setscrew with a 1/4-28UNF x .312 inch long setscrew if damage is indicated.
 - Carefully install circulating fan on fan shaft.
 - Tighten setscrew in circulating fan hub.
 - Align holes in blower intake ring with circulating fan housing.
 - Secure blower intake ring with screws.



OF HOUSING

nt Panel

- Align holes in thermostat switch with holes in front panel.
- Secure thermostat switch to front panel with two (2) screws.
- Align holes in front panel with holes in housing.
- Secure front panel with fourteen (14) screws.

ontrol Panel Plate

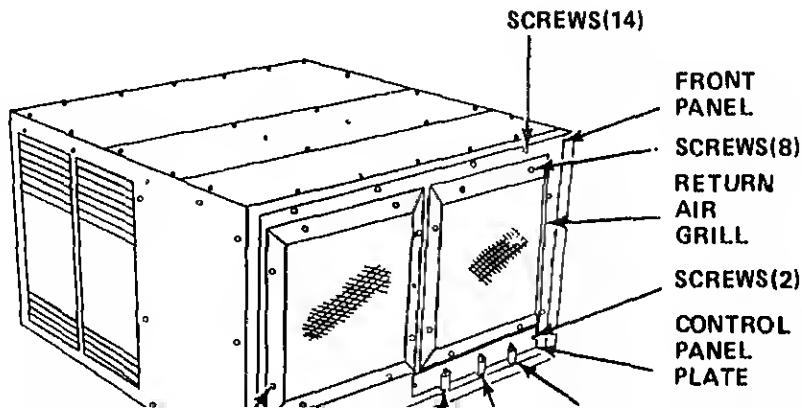
- Align holes in control panel plate with holes in front panel.
- Secure control panel plate with two (2) screws.
- Install three (3) knobs on fresh air control selector switch and thermostat switch.

Diffuser Grill

- Align holes in air diffuser grill with holes in front panel.
- Secure air diffuser grill with eight (8) screws.

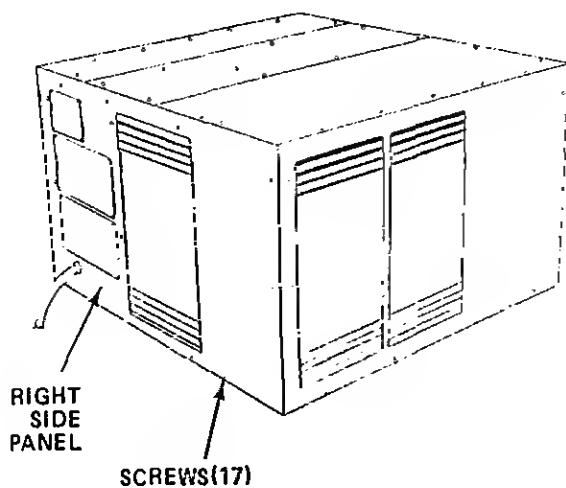
urn Air Grill

- Align holes in return air grill with holes in front panel.
- Secure return air grill with eight (8) screws.
- Install wire in mechanical screw post and tighten mechanical screw post.



15. Right Side Panel

- a. Align holes in right side panel with housing.
- b. Secure right side panel with seventeen screws.



- a. Removal
- b. Test

- c. Installation

INITIAL SETUP

Material/Parts

- Right Side Panel Screws (17)
- Control Panel Plate Screws (2)
- Selector Switch Screws (2)
- Return Air Grill Screws (8)

References

- Appendix F, Wiring Diagram

Troubleshooting Reference

AIR CONDITIONER, Malfunction

Approximate Time Required (in minutes)

Removal	1
Test	1
Installation	1
TOTAL TIME	3

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL

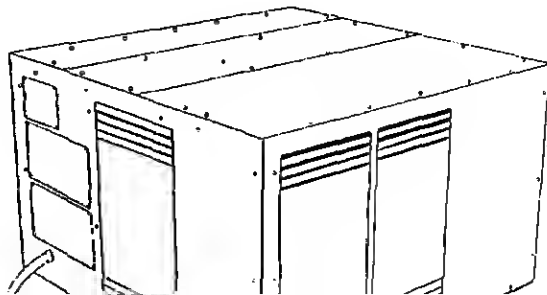
RIGHT SIDE OF HOUSING

- 1. Right Side Panel

- a. Remove seventeen (17) screws from right side panel.
- b. Remove right side panel.

NOTE

The selector switch may be tested while installed in the air conditioner. To gain access to the selector switch, remove the right side panel.



Selector Switch

TESTING

Selector Switch

- b. Partially remove return air grill from panel.
- a. Loosen setscrews and remove three (3) screws.
- b. Remove two (2) screws securing control panel plate to front panel.
- c. Remove control panel plate.
- d. Tag and disconnect electrical leads from selector switch.
- e. Remove two (2) screws securing selector switch to front panel.
- f. Remove selector switch.

- a. Tag and disconnect electrical leads from selector switch.
- b. Using an ohmmeter, measure resistance between the related contacts at each setting as follows (see Wiring Diagram, Appendix F):
 - (1) With selector switch in the "OFF" position, resistance should be high.
 - (2) With selector switch in the "FAN" position, high resistance should be indicated at the compressor terminal and low resistance should be indicated at the fan terminal.
 - (3) With selector switch in the "HEAT" position, low resistance should be indicated.
- c. Replace selector switch if testing indicates that it is defective.

INSTALLATION

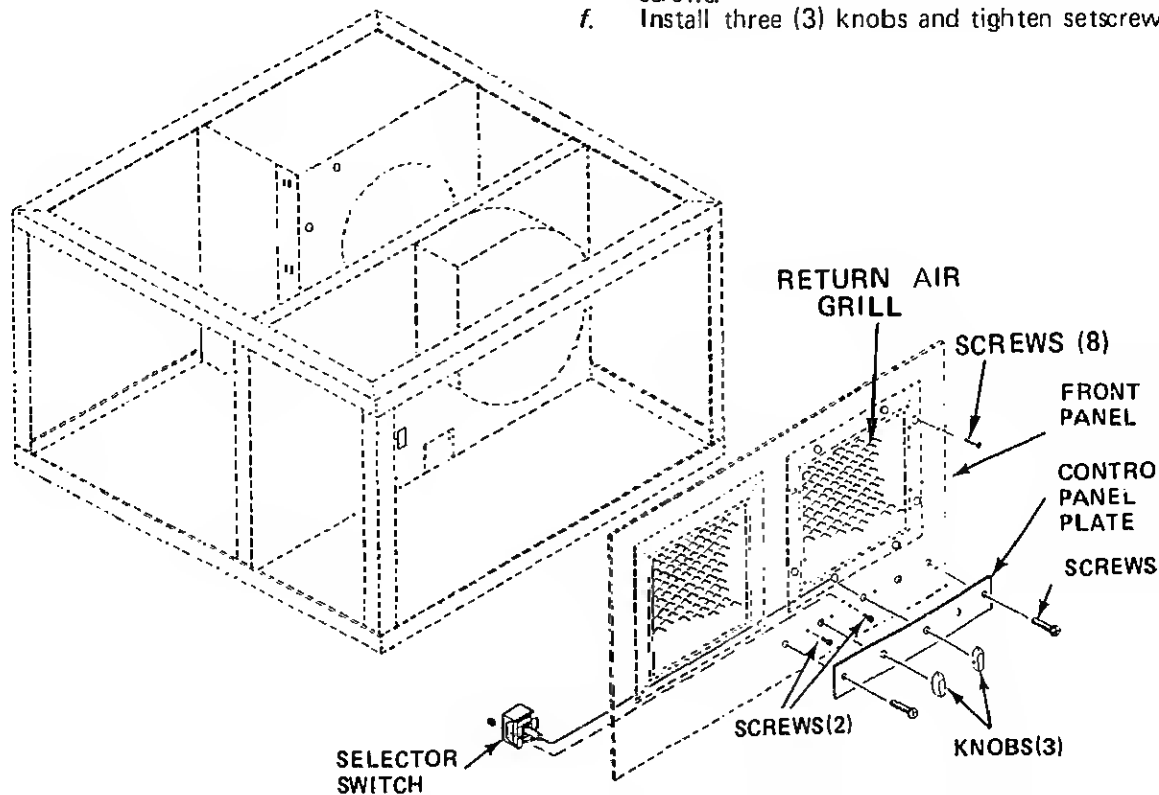
FRONT OF HOUSING

Selector Switch

- a. Connect electrical leads to selector switch and remove tags.
- b. Align holes in selector switch with holes in front panel.
- c. Secure selector switch with two (2) screws.
- d. Align holes in control panel plate with holes in front panel.
- e. Secure control panel plate with two screws.

Return Air Grill

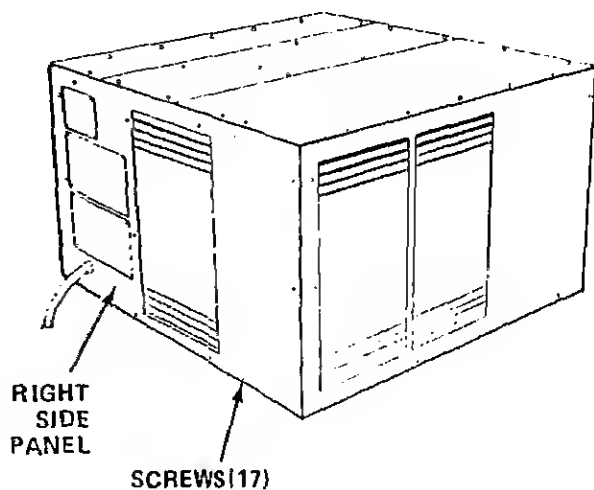
- a. Align holes in return air grill with holes in front panel.
- b. Secure return air grill to front panel with eight (8) screws.
- a. Connect electrical leads to selector switch and remove tags.
- b. Align holes in selector switch with holes in front panel.
- c. Secure selector switch with two (2) screws.
- d. Align holes in control panel plate with holes in front panel.
- e. Secure control panel plate with two (2) screws.
- f. Install three (3) knobs and tighten setscrew.



RIGHT SIDE OF HOUSING

7. Right Side Panel

- a. Align holes in right housing.
- b. Secure right side panel screws.



TIAL SETUP

Material/Parts

Right Side Panel Screws (17)
 Control Panel Plate Screws (2)
 Thermostat Switch Screws (2)
 Return Air Grill Screws (8)

References

Appendix F, Wiring Diagram

Troubleshooting Reference

AIR OUTPUT, Malfunction 2, Step 2

Approximate Time Required (in minutes)

Removal	10
Test	10
Installation	10
TOTAL TIME	30

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL

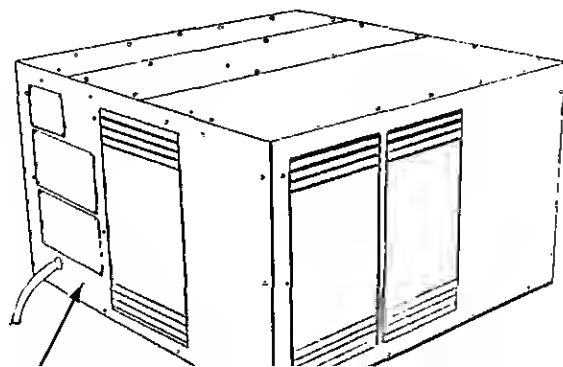
RIGHT SIDE OF HOUSING

Right Side Panel

- Remove seventeen (17) screws securing right side panel.
- Remove right side panel.

NOTE

The thermostat switch may be tested while installed in the air conditioner. To gain access to the selector switch, remove the right side panel.



d. Partially remove return air grill from front panel.

CAUTION

Carefully unwrap thermostat switch sensing bulb from expansion valve sensing line. Use care to prevent damage to sensing bulb.

Thermostat Switch

- a.* Loosen setscrews and remove three (3) knobs.
- b.* Remove two (2) screws securing control panel plate to front panel.
- c.* Remove control panel plate.
- d.* Tag and disconnect electrical leads from thermostat switch.
- e.* Remove two (2) screws securing thermostat switch to front panel.
- f.* Unwrap thermostat switch sensing bulb and remove thermostat switch.

TESTING

Thermostat Switch

- a.* Tag and disconnect electrical leads from thermostat switch.
- b.* With the thermostat switch set below room temperature, use an ohmmeter and measure for continuity across the thermostat switch terminals (see Wiring Diagram, Appendix).
- c.* Verify that the resistance indicated is zero ohms.
- d.* Move thermostat switch setting to a position above room temperature.
- e.* Verify that the resistance is infinity.
- f.* Replace thermostat switch if testing indicates that it is defective.

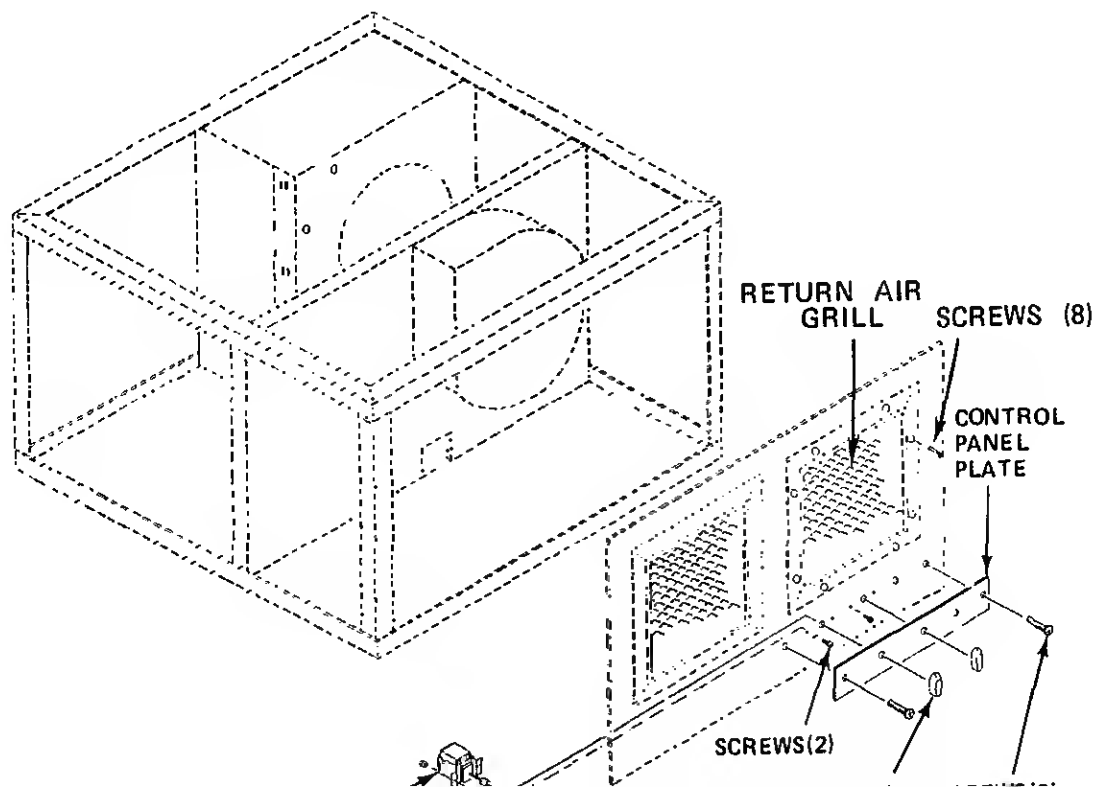
INSTALLATION

FRONT OF HOUSING

Thermostat Switch

- a.* Connect electrical leads to thermostat switch and remove tags.
- b.* Align holes in thermostat switch with holes in front panel.
- c.* Secure thermostat switch with two (2) screws.
- d.* Carefully wrap thermostat switch sensing bulb around expansion valve sensing line.

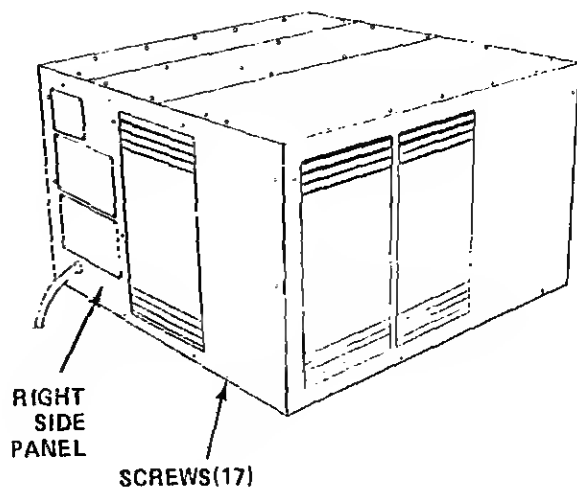
- a. Align holes in return air grill with holes in front panel.
- b. Secure return air grill to front panel with eight (8) screws.
- a. Connect electrical leads to thermostat switch and remove tags.
- b. Align holes in thermostat switch with holes in front panel.
- c. Secure thermostat switch with two (2) screws.
- d. Align holes in control panel plate with holes in front panel.
- e. Secure control panel plate with two (2) screws.
- f. Install three (3) knobs and tighten setscrews.



RIGHT SIDE OF HOUSING

7. Right Side Panel

- a.* Align holes in right side housing.
- b.* Secure right side panel screws.



INITIAL SETUP**Material/Parts**

Right Side Panel Screws (17)
Capacitor Bracket Screws (2)

Troubleshooting Reference

FANS, Malfunction 1, Step 4

Approximate Time Required (in minutes)

Removal	10
Testing	5
Installation	10
TOTAL TIME	25

References

None

LOCATION/ITEM**REMARKS****ACTION****REMOVAL****RIGHT SIDE OF HOUSING**

1. Right Side Panel

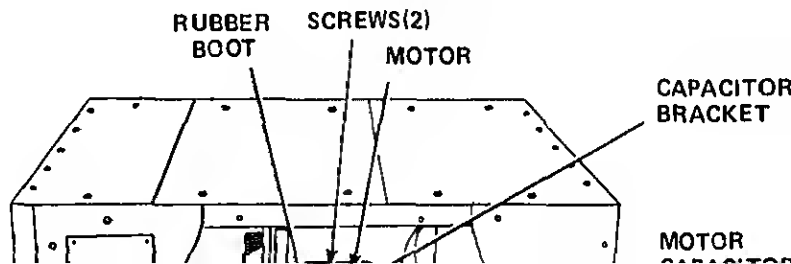
- Remove seventeen (17) screws securing side panel.
- Remove right side panel.

WARNING

Death or serious injury may occur if capacitor is not discharged prior to removal.

2. Motor Capacitor

- Discharge motor capacitor.
- Slide rubber boot on motor capacitor to gain access to terminals.
- Tag and disconnect electrical leads from motor capacitor.
- Remove two (2) screws securing capacitor bracket to motor.
- Remove capacitor bracket and motor capacitor.



LOCATION/ITEM	REMARKS	ACTION
TESTING		
RIGHT SIDE OF HOUSING		
Motor Capacitor		<ul style="list-style-type: none">a. Test motor capacitor with a suitable capacitance tester for continuity, leakage short, and capacitance.b. The motor capacitor is rated at 3 microfarads 370 volts.c. Replace motor capacitor if testing indicates that it is defective.
INSTALLATION		
Motor Capacitor		<ul style="list-style-type: none">a. Install motor capacitor in capacitor bracket.b. Align holes in capacitor bracket and motor.c. Secure capacitor bracket with two (2) screws.d. Connect electrical leads to motor capacitor.

b. Test

INITIAL SETUP

Material/Parts

Left Side Panel Screws (17)

Troubleshooting Reference
None

Approximate Time Required (in minutes)

Removal 10

Testing 10

Installation 10

TOTAL TIME 30

References
None

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL

LEFT SIDE OF HOUSING

1. Left Side Panel

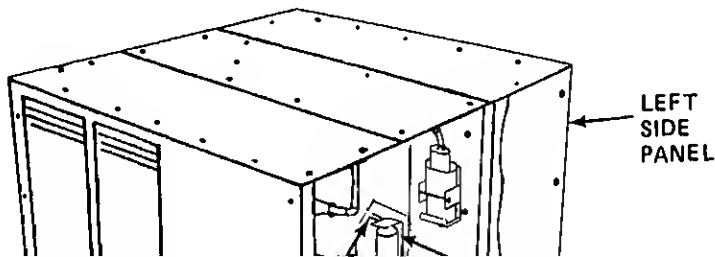
- Remove seventeen (17) screws securing side panel to housing.
- Remove left side panel.

WARNING

Death or serious injury may occur if capacitor is not discharged prior to removal.

2. Start Capacitor

- Pull start capacitor from bracket.
- Remove cap from start capacitor.
- Discharge start capacitor.
- Tag and disconnect electrical leads from capacitor.



LOCATION/ITEM	REMARKS	ACTION
TESTING		
LEFT SIDE OF HOUSING		
3. Start Capacitor		<ul style="list-style-type: none"> a. Test start capacitor with a suitable tester for continuity, leakage capacitance. b. The start capacitor is rated 10 microfarads, 125 volts AC. c. Replace start capacitor if test indicates that it is defective.
INSTALLATION		
4. Start Capacitor		<ul style="list-style-type: none"> a. Connect electrical leads to start capacitor and remove tags. b. Cover electrical leads with cap.

INITIAL SETUP

Material/Parts

Left Side Panel Screws (17)

Troubleshooting Reference

None

Approximate Time Required (in minutes)

Removal 10

Testing 10

Installation 10

TOTAL TIME 30

References

None

LOCATION/ITEM

REMARKS

ACTION

REMOVAL

LEFT SIDE OF HOUSING

1. Left Side Panel

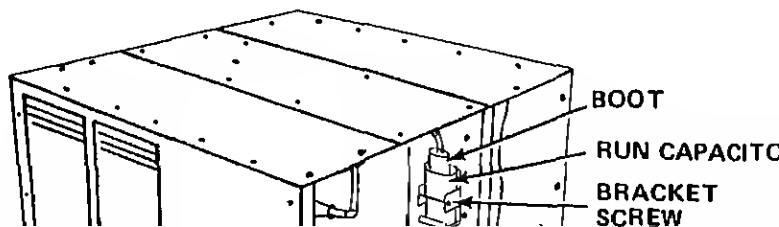
- Remove seventeen (17) screws securing side panel to housing.
- Remove left side panel.

WARNING

Death or serious injury may occur if capacitor is not discharged prior to removal.

2. Run Capacitor

- Discharge run capacitor.
- Remove cap from run capacitor.
- Tag and disconnect electrical leads from capacitor.
- Loosen capacitor bracket screw.
- Remove run capacitor from capacitor bracket.



LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

TESTING

LEFT SIDE OF HOUSING

3. Run Capacitor

- Test run capacitor with a suitable capacitor tester for continuity, leakage short circuit and capacitance.
- The run capacitor is rated at 7.5 microfarads 370 volts.
- Replace run capacitor if testing indicates it is defective.

INSTALLATION

4. Run Capacitor

- Install run capacitor in capacitor bracket.
- Tighten capacitor bracket screw.
- Connect electrical leads to run capacitor.

- a. Removal
- b. Test

c. Installation

INITIAL SETUP

Material/Parts

- Top Center Panel Screws (10)
- Top Rear Panel Screws (10)
- Start Relay Screw (1)
- Start Relay Nut (1)

References

None

Troubleshooting Reference

COMPRESSOR, Malfunction 1

Approximate Time Required (in minutes)

Removal

Testing

Installation

TOTAL TIME

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL

TOP OF HOUSING

1. Top Center Panel

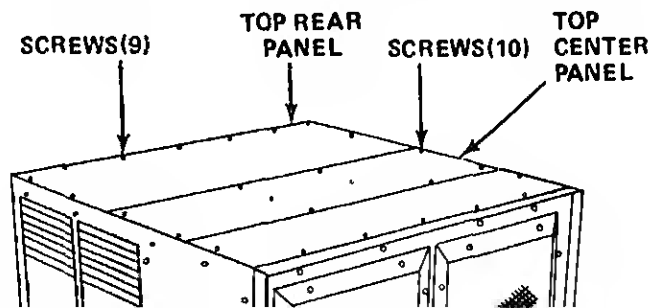
- a. Remove ten (10) screws securing panel to housing.
- b. Remove top center panel.

2. Top Rear Panel

- a. Remove nine (9) screws securing panel to housing.
- b. Remove top rear panel.

NOTE

The start relay may be tested while installed in the air conditioner. To gain access to the start relay, remove the top center and top rear panels.



TOP OF HOUSING

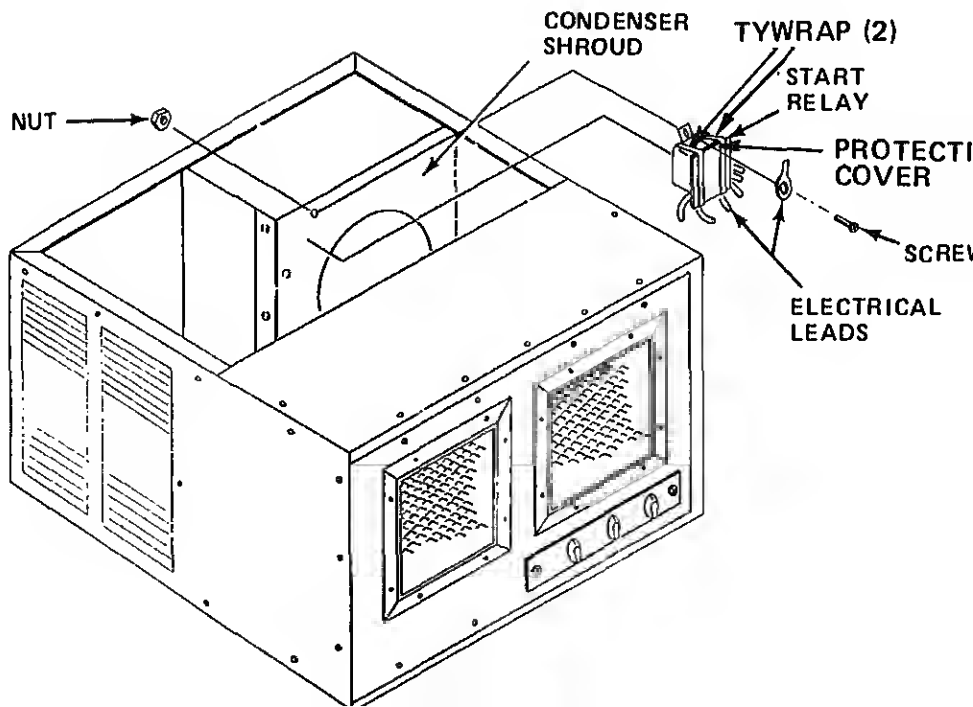
3. Start Relay

- a. Slip two (2) tywraps from around start relay.
- b. Remove protective cover.
- c. Tag and disconnect electrical leads from relay.
- d. Remove one (1) screw and self-locking nut securing start relay to condenser shroud.
- e. Remove electrical lead and start relay.

TESTING

4. Start Relay

- a. Tag and disconnect electrical leads from relay.
- b. Using an ohmmeter, measure continuity across start relay terminals.
- c. Replace start relay if there is NO continuity.



TOP OF HOUSING

Start Relay

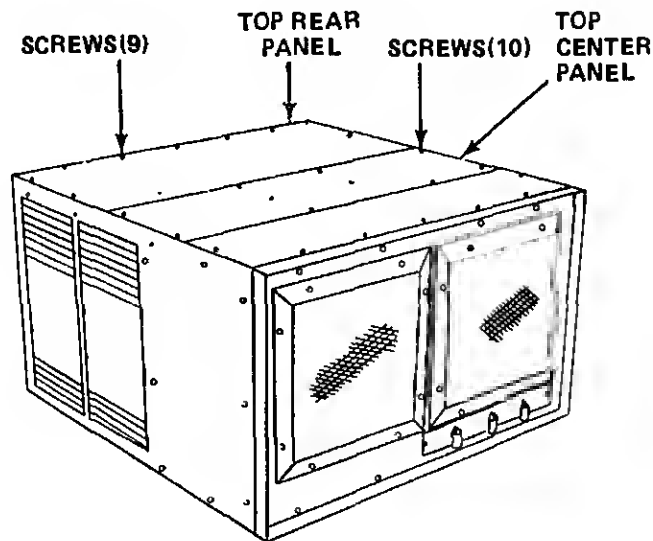
- a. Connect electrical leads to start relay and remove tags.
- b. Align hole in start relay with hole in condenser shroud.
- c. Secure electrical lead and start relay with (1) screw and self-locking nut.
- d. Replace protective cover and secure with (2) tywraps.

Top Rear Panel

- a. Align holes in top rear panel and housing.
- b. Secure top rear panel with nine (9) screws.

Top Center Panel

- a. Align holes in top center panel with holes in top rear and top front panels.
- b. Secure top center panel with ten (10) screws.



- a. Removal
- b. Inspection
- c. Test

- d. Repair
- e. Installation

INITIAL SETUP

Material/Parts

- Top Center Panel Screws (10)
- Top Front Panel Screws (7)
- Top Rear Panel Screws (9)
- Right Side Panel Screws (17)
- Left Side Panel Screws (17)

References

Appendix F, Wiring Diagram

Troubleshooting Reference

COMPRESSOR, Malfunction 1, Step 2

Approximate Time Required (in minutes)

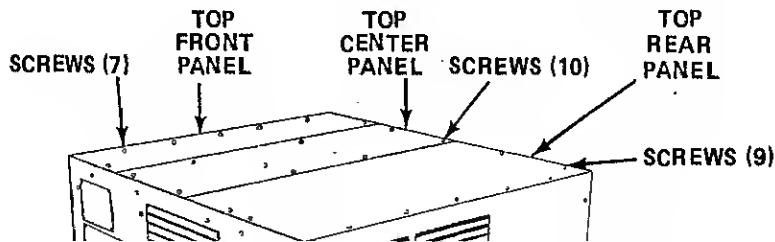
Removal	30
Inspection and Testing	30
Repair	30
Installation	30
TOTAL TIME	120

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL

TOP AND RIGHT SIDE OF HOUSING

- | | |
|---------------------|--|
| 1. Top Center Panel | <ul style="list-style-type: none"> a. Remove ten (10) screws securing to panel. b. Remove top center panel. |
| 2. Top Front Panel | <ul style="list-style-type: none"> a. Remove seven (7) screws securing to panel. b. Remove top front panel. |
| 3. Top Rear Panel | <ul style="list-style-type: none"> a. Remove nine (9) screws securing to panel. b. Remove top rear panel. |
| 4. Right Side Panel | <ul style="list-style-type: none"> a. Remove seventeen (17) screws securing to side panel. b. Remove right side panel. |



Wiring

SECTION AND TESTING

INSIDING INTERIOR

Electrical Leads

side panel to housing.

b. Remove left side panel.

Remove only those electrical leads or wires that show signs of damage.

- a. Inspect all electrical leads for cracked or frayed insulation material.
- b. Inspect all terminals for damaged connections.
- c. Disconnect each end of the following electrical leads and using a multimeter, low ohms scale, touch probes to ends of each electrical lead and verify that there is continuity (see Wiring Diagram, Appendix B):
- | | | |
|-----|------|-------------|
| (1) | K1-2 | B1-S |
| (2) | K1-5 | B1-CO |
| (3) | K1-1 | |
| (4) | K1-4 | |
| (5) | K1-4 | |
| (6) | S1-2 | |
| (7) | S2-2 | B |
| (8) | K1-2 | |
| (9) | C2 | |
- d. Repair or replace any electrical lead if there is NO continuity.

Power Cable

- a. Inspect power cable for cracked or frayed insulation material.
- b. Inspect all terminals for damaged connections.
- c. Disconnect each end of the power cable terminations and using a multimeter, low ohms scale, touch probes to each termination and their corresponding connector pin and verify that there is continuity (see Wiring Diagram, Appendix B):
- | | |
|-----|--------|
| (1) | K1-4 |
| (2) | K1-5 |
| (3) | GROUND |
- d. Repair or replace power cable if there is NO continuity.

TOP AND RIGHT SIDE OF HOUSING

10. Right Side Panel

- a.* Align holes in right side panel with holes in housing.
- b.* Secure right side panel with seventeen screws.

11. Top Rear Panel

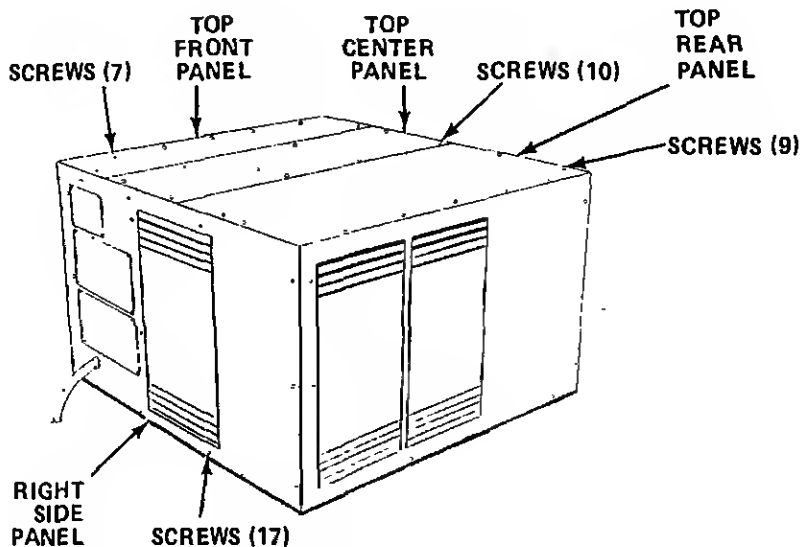
- a.* Align holes in top rear panel with holes in housing.
- b.* Secure top rear panel with nine (9) screws.

12. Top Front Panel

- a.* Align holes in top front panel with holes in housing.
- b.* Secure top front panel with seven (7) screws.

13. Top Center Panel

- a.* Align holes in top center panel with holes in top front and top rear panels.
- b.* Secure top center panel with ten (10) screws.



Removal
Inspection

c. Installation

INITIAL SETUP

Material/Parts

Left Side Panel Screws (17)

Troubleshooting Reference

AIR CONDITIONER, Malfunction 2,

Approximate Time Required (in minutes)

Removal 10

Inspection 5

Installation 10

TOTAL TIME 25

References

None

LOCATION/ITEM

REMARKS

ACTION

REMOVAL

LEFT SIDE OF HOUSING

1. Left Side Panel

- Remove seventeen (17) screws securing left side panel to housing.
- Remove left side panel.

INSPECTION

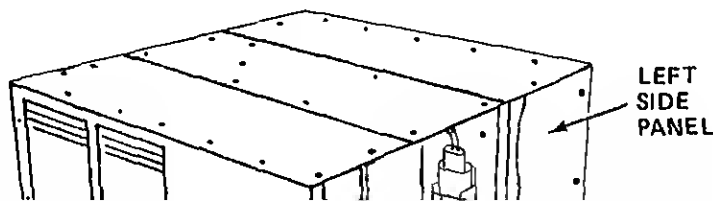
2. Compressor

- Visually inspect compressor for damage.
- Inspect compressor tubing and fittings for leaks.
- Tighten fittings and report damaged components to direct support maintenance personnel.

INSTALLATION

3. Left Side Panel

- Align holes in left side panel with housing.
- Secure left side panel with seventeen screws.



Material/Parts

Air Diffuser Grill Screws (8)
 Control Panel Plate Screws (2)
 Front Panel Screws (14)
 Top Center Panel Screws (10)
 Top Front Panel Screws (7)
 Top Rear Panel Screws (9)
 Right Side Panel Screws (17)
 Rear Panel Screws (14)
 Return Air Grill Screws (8)

References

None

Troubleshooting Reference

None

Approximate Time Required (in minutes)

Removal	3
Inspection	1
Installation	3
TOTAL TIME	7

LOCATION/ITEM**REMARKS****ACTION****REMOVAL****TOP AND LEFT SIDE OF HOUSING****1. Top Center Panel**

- Remove ten (10) screws securing panel.
- Remove top center panel.

2. Top Front Panel

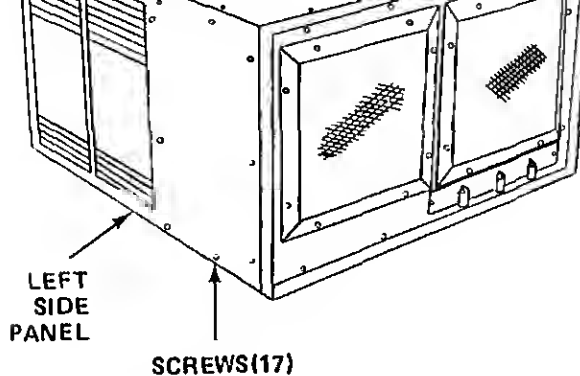
- Remove seven (7) screws securing panel.
- Remove top front panel.

3. Top Rear Panel

- Remove nine (9) screws securing panel.
- Remove top rear panel.

4. Left Side Panel

- Remove seventeen (17) screws securing side panel.
- Remove left side panel.



LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL

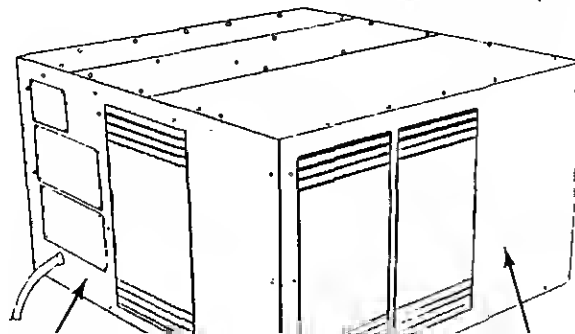
RIGHT SIDE AND REAR OF HOUSING

Right Side Panel

- Remove seventeen (17) screws securing side panel.
- Remove right side panel.

Rear Panel

- Remove fourteen (14) screws securing panel.
- Remove rear panel.



REMOVAL OF HOUSING

Return Air Grill

- a. Loosen mechanical screw post at rear of return air grill and remove wire.
- b. Remove eight (8) screws securing return air grill.
- c. Remove return air grill.

Air Diffuser Grill

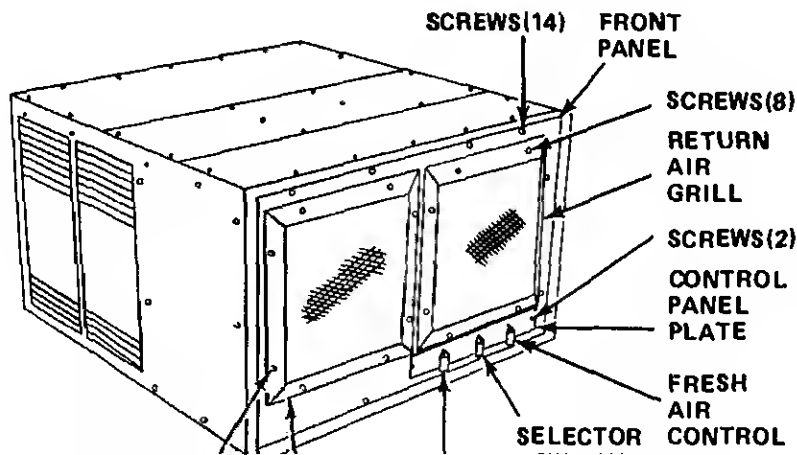
- a. Remove eight (8) screws securing air diffuser grill.
- b. Remove air diffuser grill.

Control Panel Plate

- a. Loosen setscrews and remove knobs for fresh air control, selector switch and thermostat switch.
- b. Remove two (2) screws securing control panel plate.
- c. Remove control panel plate.

Front Panel

- a. Remove two (2) screws securing thermostat switch to front panel.
- b. Remove fourteen (14) screws securing front panel.
- c. Remove front panel.



HOUSING INTERIOR

Refrigerant Piping

INSTALLATION

FRONT OF HOUSING

Front Panel

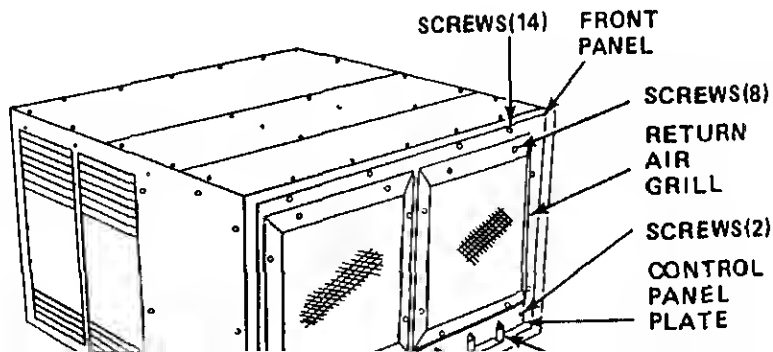
- a. Visually inspect all piping for damage and poor condition.
- b. Inspect all fittings for leaks.
- c. Tighten fittings and report damaged components to direct support maintenance personnel.

Control Panel Plate

- a. Align holes in thermostat switch with holes in front panel.
- b. Secure thermostat switch to front panel with two (2) screws.
- c. Align holes in front panel with holes in housing.
- d. Secure front panel with fourteen (14) screws.

Air Diffuser Grill

- a. Align holes in control panel plate with holes in front panel.
- b. Secure control panel plate with two (2) screws.
- c. Install three (3) knobs.
- a. Align holes in air diffuser grill with holes in front panel.
- b. Secure air diffuser grill with eight (8) screws.



5. Return Air Grill

- a. Align holes in return air grill with front panel.
- b. Secure return air grill with eight (8) screws.
- c. Install wire in mechanical screw post, tighten mechanical screw post.

INSTALLATION

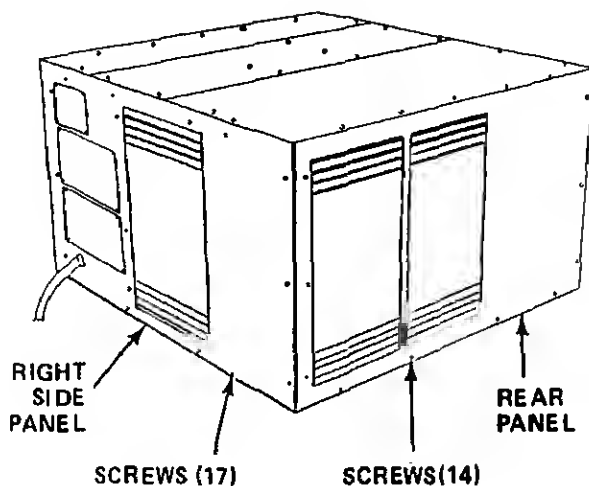
RIGHT SIDE AND REAR OF HOUSING

6. Rear Panel

- a. Align holes in rear panel with housing.
- b. Secure rear panel with fourteen (14) screws.

7. Right Side Panel

- a. Align holes in right side panel with housing.
- b. Secure right side panel with seventeen (17) screws.



18. Left Side Panel

- a. Align holes in left side panel with housing.
- b. Secure left side panel with seven screws.

19. Top Rear Panel

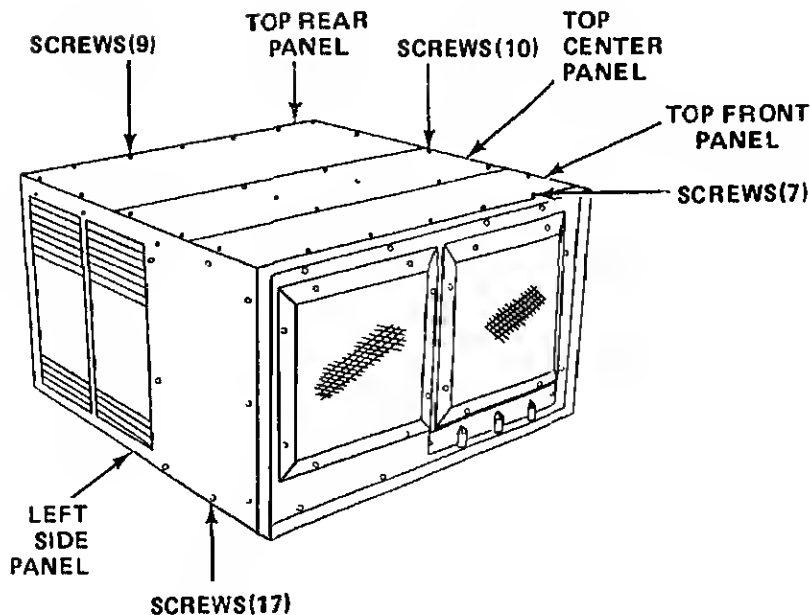
- a. Align holes in top rear panel with housing.
- b. Secure top rear panel with nine (9) screws.

20. Top Front Panel

- a. Align holes in top front panel with housing.
- b. Secure top front panel with seven screws.

21. Top Center Panel

- a. Align holes in top center panel with top front and top rear panels.
- b. Secure top center panel with ten (10) screws.



- a. Removal
- b. Inspection

- c. Service
- d. Installation

INITIAL SETUP

Material/Parts

- Air Diffuser Grill Screws (8)
- Left Side Panel Screws (17)
- Dry Cleaning Solvent

References
None

Troubleshooting Reference

AIR OUTPUT, Malfunction 1, Step

Approximate Time Required (in minutes)

Removal	10
Inspection and Service	10
Installation	10
TOTAL TIME	30

LOCATION/ITEM

REMARKS

ACTION

REMOVAL

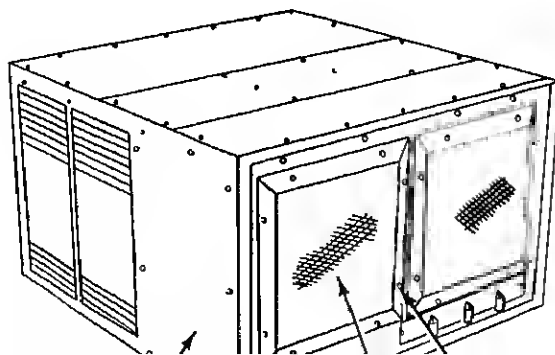
FRONT AND LEFT SIDE OF HOUSING

1. Air Diffuser Grill

- a. Remove eight (8) screws securing a grill to front panel.
- b. Remove air diffuser grill.

2. Left Side Panel

- a. Remove seventeen (17) screws securing side panel to housing.
- b. Remove left side panel.



Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).

WARNING

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

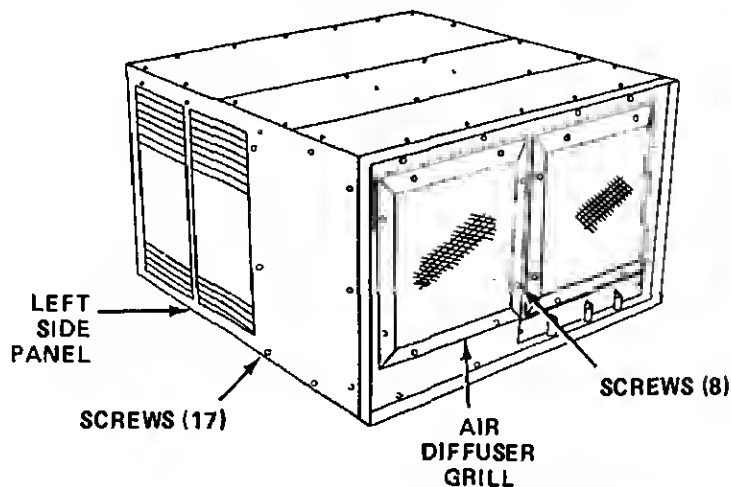
Evaporator Coil

- a. Inspect evaporator coil for cleanliness.
- b. Scrub the external portion of evaporator with a stiff bristle brush to remove scale and corrosion.
- c. Use low pressure compressed air to blow loose material.
- d. Wipe evaporator coil with a cloth moistened with dry cleaning solvent, specifically P-D-680 or P-S-661.
- e. Inspect evaporator coil for leaks.
- f. Straighten bent fins.
- g. Report damaged condition to direct supervisor or maintenance personnel.

Air Diffuser Grill

Left Side Panel

- a. Align holes in air diffuser grill with holes in front panel.
- b. Secure air diffuser grill with eight (8) screws.
- a. Align holes in left side panel with holes in housing.
- b. Secure left side panel with seventeen screws.



- a. Removal
b. Inspection

- c. Service
d. Installation

INITIAL SETUP

Material/Parts

- Rear Panel Screws (14)
Dry Cleaning Solvent

Troubleshooting Reference

- AIR CONDITIONER, Malfunction
AIR OUTPUT, Malfunction

Approximate Time Required (in minutes)

- Removal
Inspection and Service
Installation
TOTAL TIME

References
None

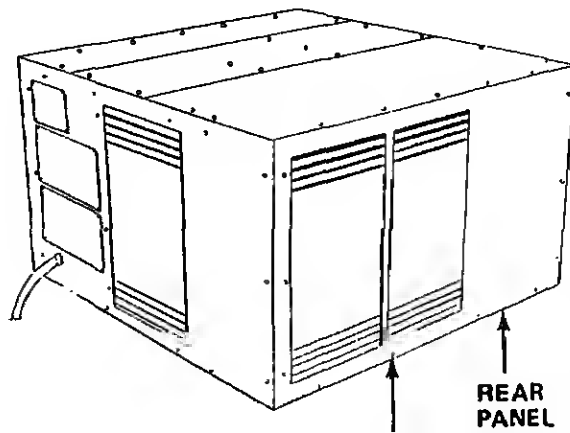
LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL

REAR OF HOUSING

1. Rear Panel

- a. Remove fourteen (14) screws from rear panel to housing.
b. Remove rear panel.



dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).

WARNING

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

2. Condenser Coil

- a.* Inspect condenser coil for cleanliness.
- b.* Scrub the external portion of condenser coil with a stiff bristle brush to remove scale and corrosion.
- c.* Use low pressure compressed air to blow off loose material.
- d.* Wipe condenser coil with a cloth moistened with dry cleaning solvent, specify P-D-680 or P-S-661.
- e.* Inspect condenser coil for leaks.
- f.* Straighten bent fins.
- g.* Report damaged condition to direct maintenance personnel.

INSTALLATION

REAR OF HOUSING

3. Rear Panel

- a.* Align holes in rear panel with holes in housing.
- b.* Secure rear panel with fourteen (14) screws.

- a. Removal
- b. Inspection

c. Installation

INITIAL SETUP

Material/Parts

Rear Panel Screws (14)

Troubleshooting Reference
None

Approximate Time Required (in minutes)

Removal	10
Inspection	5
Installation	10
TOTAL TIME	25

References
None

LOCATION/ITEM

REMARKS

ACTION

NOTE

The sight glass may be inspected by looking through the louvers in the left side panel. If you cannot see the sight glass through the left side panel, then remove the rear panel.

REMOVAL

REAR OF HOUSING

1. Rear Panel

- a. Remove fourteen (14) screws panel to housing.
- b. Remove rear panel.

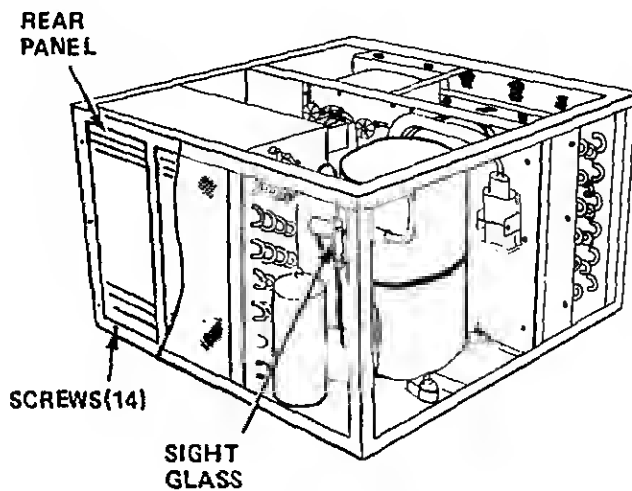
INSPECTION

2. Sight Glass

- a. With air conditioner operating and cooling air, inspect sight glass.
- b. Yellow appearance of humidity indicates moisture in system. milky flow in refrigerant indicates refrigerant charge.
- c. Report presence of these conditions to support maintenance personnel.

3. Rear Panel

- a. Align holes in rear panel with housing.
- b. Secure rear panel with fourteen



- a. Removal
- b. Inspection

c. Installation

INITIAL SETUP

Material/Parts

- Top Center Panel Screws (10)
- Top Front Panel Screws (7)
- Right Side Panel Screws (17)

References
None

Troubleshooting Reference
None

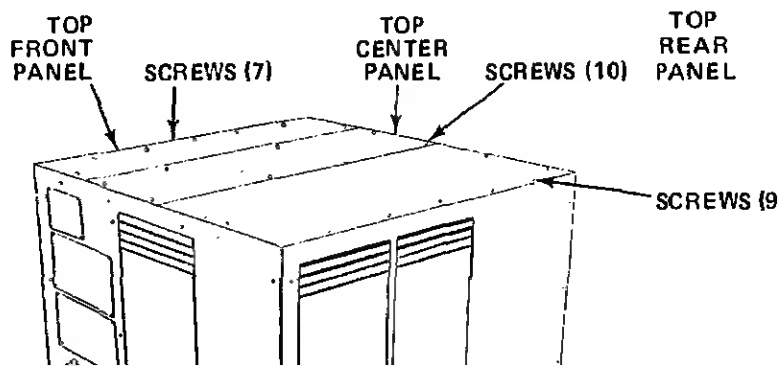
Approximate Time Required (in minutes)

Removal	1
Inspection	1
Installation	1
TOTAL TIME	3

LOCATION/ITEM	REMARKS	ACTION
REMOVAL		

TOP AND RIGHT SIDE OF HOUSING

1. Top Center Panel
 - a. Remove ten (10) screws securing panel.
 - b. Remove top center panel.
2. Top Front Panel
 - a. Remove seven (7) screws securing panel.
 - b. Remove top front panel.
3. Right Side Panel
 - a. Remove seventeen (17) screws securing side panel.
 - b. Remove right side panel.



Expansion Valve

- a. Inspect expansion valve for cracks or damaged condition.
- b. Inspect capillary tube for kinks or breaks.
- c. Inspect sensing bulb for security of attachment and be sure it is completely covered with insulation tape.
- d. Report damaged condition to direct supervisor or maintenance personnel.

INSTALLATION

TOP AND RIGHT SIDE OF HOUSING

Right Side Panel

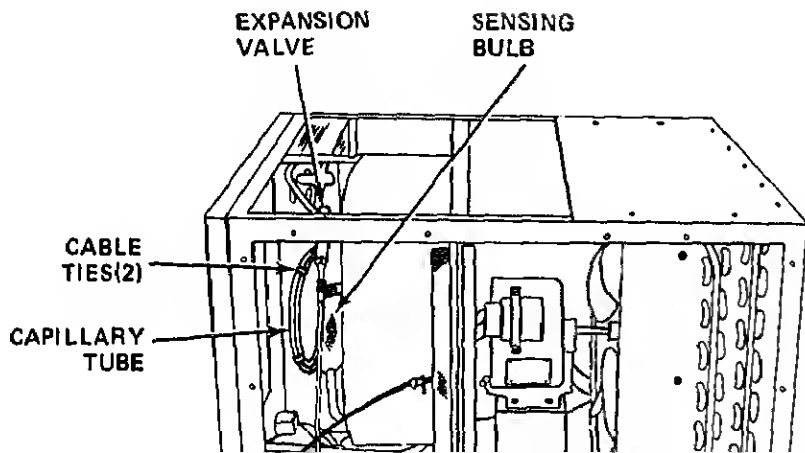
- a. Align holes in right side panel with housing.
- b. Secure right side panel with seventeen (17) screws.

Top Front Panel

- a. Align holes in top front panel with housing.
- b. Secure top front panel with seven (7) screws.

Top Center Panel

- a. Align holes in top center panel with holes in top front and top rear panels.
- b. Secure top center panel with ten (10) screws.



not required.

- c. Before placing the unit in storage, the next scheduled preventive maintenance check services should be performed, and all known deficiencies corrected.

This chapter contains all the necessary maintenance instructions for direct support maintenance personnel. Keep your air conditioner in good repair.

INDEX

	Para	Page
Common Tools and Equipment	5-2	5-1
Consumable Materials	5-4	5-1
Direct Support Maintenance Procedures	5-7	5-4
Direct Support Troubleshooting	5-5	5-2
Direct Support Troubleshooting Table	5-6	5-2
Maintenance Repair Parts	5-1	5-1
Special Tools and Test Equipment	5-3	5-1

Section 1. REPAIR PARTS, SPECIAL TOOLS, TMD AND SUPPORT EQUIPMENT

1. MAINTENANCE REPAIR PARTS

Repair parts for the air conditioner are listed and illustrated in TM 5-4120-341-23P.

2. COMMON TOOLS AND EQUIPMENT

For common tools and equipment, refer to the Table of Organization and Equipment (TOE).

3. SPECIAL TOOLS AND TEST EQUIPMENT

No special tools or test equipment are required.

4. CONSUMABLE MATERIALS

Item No.	Name	Specification
5	Refrigerant	R-12

5-5. GENERAL

a. This section provides information useful in diagnosing and correcting unsatisfactory operation of the air conditioner. Each malfunction is followed by a list of probable causes and actions to remedy the malfunction. You should perform the tests/inspections and corrective actions in the listed.

b. This manual cannot list all malfunctions that may occur; nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

5-6. DIRECT SUPPORT TROUBLESHOOTING TABLE

Malfunction	Test or Inspection	Corrective Action
-------------	--------------------	-------------------

COMPRESSOR

1. COMPRESSOR WILL NOT START

- Step 1.* Check compressor for proper operation and damage.
Replace defective compressor (para. 5-9).

2. COMPRESSOR CYCLES INTERMITTENTLY

- Step 1.* Inspect sight glass for proper amount of refrigerant.
Add refrigerant as required (para. 5-8).
- Step 2.* Check for high discharge pressure.
Discharge refrigerant from system (para. 5-8).
- Step 3.* Check for air in refrigerant system.
Purge refrigerant system (para. 5-8).

AIR CONDITIONER

1. HIGH DISCHARGE PRESSURE

- Step 1.* Check for excessive refrigerant in system.
Discharge refrigerant from system (para. 5-8).
- Step 2.* Check for air in refrigerant system.
Purge refrigerant system (para. 5-8).

2. LOW DISCHARGE PRESSURE

- Step 1.* Check to see if compressor is pumping.
Replace defective compressor (para. 5-9).
- Step 2.* Inspect sight glass for proper amount of refrigerant.
Add refrigerant as required (para. 5-8).

- Step 4.* Inspect expansion valve for proper operation and damage.
Replace defective expansion valve (para. 5-15).

LOW SUCTION PRESSURE

- Step 1.* Inspect expansion valve for proper operation.
Replace defective expansion valve (para. 5-15).
- Step 2.* Check to see if dehydrator is clogged or defective.
Remove restriction or replace dehydrator (para. 5-13).

LOW SUCTION AND DISCHARGE PRESSURE

- Step 1.* Inspect sight glass for proper amount of refrigerant.
Add refrigerant as required (para. 5-8).
- Step 2.* Inspect refrigerant piping for leaks.
Repair leaks or replace piping (para. 5-10).
- Step 3.* Inspect expansion valve for proper operation and damage.
Replace defective expansion valve (para. 5-15).
-

	Para	Page
Compressor	5-9	5-11
Condenser Coil	5-12	5-38
Dehydrator	5-13	5-43
Evaporator Coil	5-11	5-28
Expansion Valve	5-15	5-47
General	5-7	5-4
Refrigerant Piping	5-10	5-18
Refrigerant Servicing	5-8	5-5
Sight Glass	5-14	5-45

5-7. GENERAL

The following information pertains to all procedures for the direct support maintenance personnel.

INITIAL SETUP

Applicable Configurations
All

Special Environmental Conditions
None

Test Equipment
None

Special Tools
None

Personnel Required
Direct Support Maintenance

General Safety Instructions

Disconnect the power source before performing any maintenance function. Do not use compressed air for cleaning purposes except where required, less than 30 psi and then only with effective guarding and personal protective equipment.

IAL SETUP

Material/Parts

- Top Center Panel Screws (10)
- Dry Nitrogen
- Refrigerant R-12
- Rear Panel Screws (14)

Troubleshooting Reference

- COMPRESSOR, Malfunction 2, Step 1
- COMPRESSOR, Malfunction 2, Step 2
- COMPRESSOR, Malfunction 2, Step 3
- AIR CONDITIONER, Malfunction 1, Step 1
- AIR CONDITIONER, Malfunction 1, Step 2
- AIR CONDITIONER, Malfunction 3, Step 1
- AIR CONDITIONER, Malfunction 3, Step 2
- AIR CONDITIONER, Malfunction 5, Step 1

References

Paragraph 5-13

Approximate Time Required (in minutes)

Removal	10
Test	30
Service	720
Installation	10
TOTAL TIME	770

LOCATION/ITEM

REMARKS

ACTION

OVAl

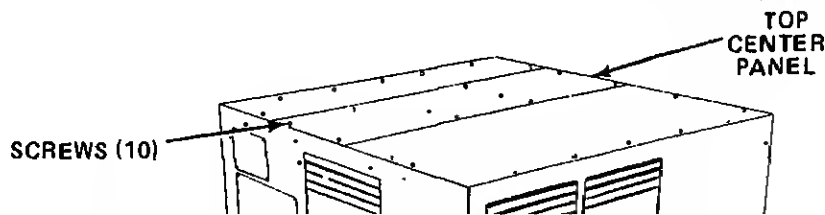
AND REAR OF HOUSING

Top Center Panel

- a. Remove ten (10) screws securing top center panel.
- b. Remove top center panel.

Rear Panel

- a. Remove fourteen (14) screws securing rear panel.
- b. Remove rear panel.

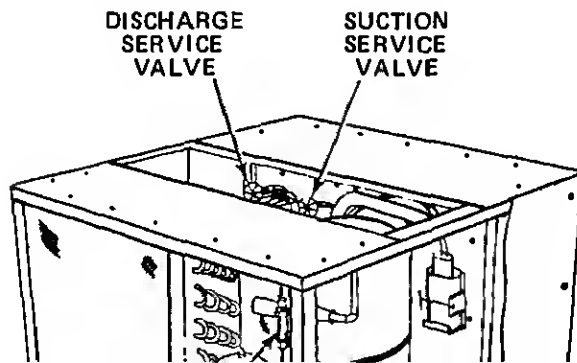


Refrigerant System

- a. Remove caps from discharge and suction service valves.
- b. Pressure check the refrigerant system as follows:
 - (1) Connect suction pressure gauge to suction service valve.
 - (2) Start air conditioner.
 - (3) Connect discharge pressure gauge to discharge service valve.
 - (4) Open discharge and suction service valves.
 - (5) Compare gauge readings with the normal range of system pressure as shown in the following table.
 - (6) Close discharge and suction service valves.
 - (7) Remove gauges and install valve caps.

Normal Operating Pressures

	<i>Outdoor Ambient Temperature</i>	
	<i>120° F/125° F (48.9° C/57.7° C)</i>	<i>95° F (35° C)</i>
	At 90° F/75° F (32.2° C/23.9° C) DB return air to unit	
Suction Pressure	54-64 psi (374-443 kPa)	
Discharge Pressure	230-260 psi (1592-1799 kPa)	
	At 80° F/67° F (26.7° C/19.4° C) DB return air to unit	
Suction Pressure	38-49 psi (263-339 kPa)	
Discharge Pressure	160-185 psi (1107-1280 kPa)	



WARNING

Avoid bodily contact with liquid refrigerant and avoid inhaling refrigerant gas. Be especially careful that Refrigerant 12 does not come in contact with eyes. In case of refrigerant leaks, ventilate area immediately.

Discharge Refrigerant System

- a. Remove valve cap from suction service valve.
- b. Attach suitable hose to suction service valve.
- c. Open suction service valve and discharge refrigerant into a suitable container.
- d. Close suction service valve, remove hose and install valve cap.

CAUTION

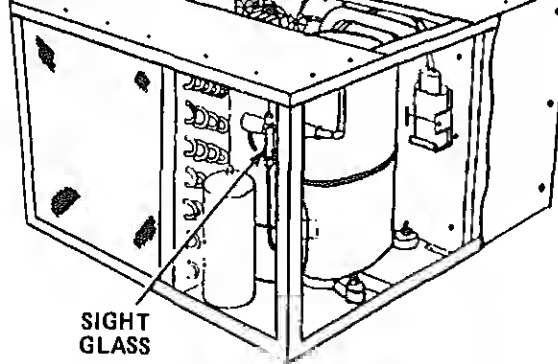
Discharge refrigerant system slowly over a period of two hours to prevent loss of oil.

Dehydrator

Refer to paragraph 5-13 and replace dehydrator

Discharge Refrigerant System

- a. Remove valve cap from discharge and suction service valves.
- b. Using proper nitrogen regulator connect cylinder of dry nitrogen to suction service valve.
- c. Attach suitable hose to discharge service valve.
- d. Open both suction and discharge service valves.
- e. Open valve on nitrogen cylinder and allow nitrogen to flow through refrigerant system until all moisture is forced out. Do not exceed 5 psig.
- f. Close nitrogen cylinder valve.
- g. Close suction and discharge service valves.
- h. Remove nitrogen cylinder and discharge hose.
- i. Using bar manifold, connect vacuum pump to center hose. Using proper hoses, connect suction service valve to suction pressure gage.
- j. Turn on vacuum pump, open service valve and hold a 29.0 inch Hg vacuum for eight (8) hours.
- k. Close suction and discharge service valves.



LOCATION/ITEM

REMARKS

ACTION

VICE

OF HOUSING

WARNING

Avoid bodily contact with liquid refrigerant and avoid inhaling refrigerant gas. Be especially careful that Refrigerant 12 does not come in contact with eyes. In case of refrigerant leaks, ventilate area immediately.

NOTE

The following steps *a.* through *i.*, apply only to a completely evacuated system. To add additional refrigerant to a charged system, refer to steps *f.* through *j.*

arging Refrigerant System

- a.* Remove valve cap from suction discharge valve.
- b.* Place inverted refrigerant drum on scale and note weight of drum.
- c.* Loosely connect the charging line of refrigerant drum to suction discharge valve.

- j.* Disconnect charging line and install on suction discharge valve.
- k.* Operate air conditioner in cooling mode for 15 minutes.
- l.* Check sight glass for gas bubbles. If bubbles are present, add additional refrigerant (steps *m.* through *v.*).
- m.* Place the same refrigerant drum on an upright position on a scale.
- n.* Remove valve cap from suction service valve.
- o.* Loosely connect charging line to suction service valve.
- p.* Partially open refrigerant drum valve to purge air from charging line.
- q.* Close refrigerant drum valve and tighten connection at suction service valve.

CAUTION

Add refrigerant slowly to avoid slugging at the compressor.

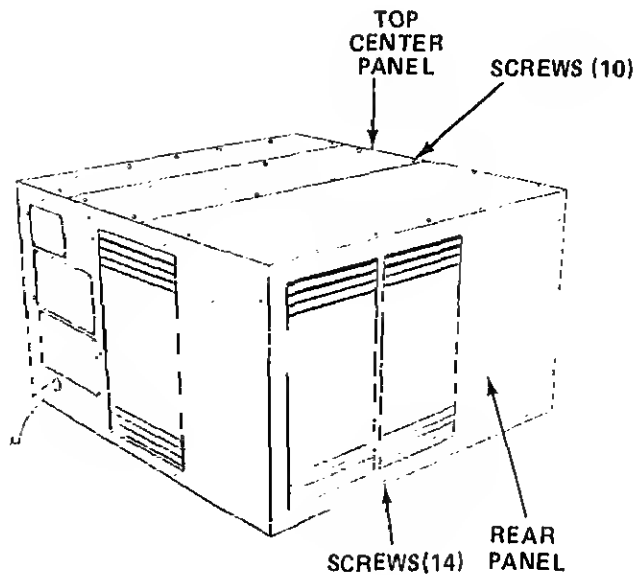
- r.* With air conditioner operating in the cooling mode, open discharge valve and refrigerant drum valve and add approximately one ounce per minute of refrigerant. Continue to observe sight glass and when bubbles appear close suction service valve.
- s.* Close refrigerant drum valve.
- t.* Carefully loosen charging line to release trapped pressure.
- u.* Disconnect charging line and install on suction service valve.

9. Rear Panel

- a. Align holes in rear panel with housing.
- b. Secure rear panel with fourteen (14)

10. Top Center Panel

- a. Align holes in top center panel with top front panel and top rear panel.
- b. Secure top center panel with ten (10)



- b. Test
- c. Service

- e. Installation

INITIAL SETUP

Material/Parts

- Top Center Panel Screws (10)
- Top Rear Panel Screws (9)
- Rear Panel Screws (14)
- Nuts (4)
- Capscrews (4)
- Flat Washers (8)

References

- Paragraph 2-12
- Paragraph 2-14
- Paragraph 5-8
- Paragraph 5-13

Troubleshooting Reference

- COMPRESSOR, Malfunction 1, 5
- AIR CONDITIONER, Malfunction

Approximate Time Required (in minutes)

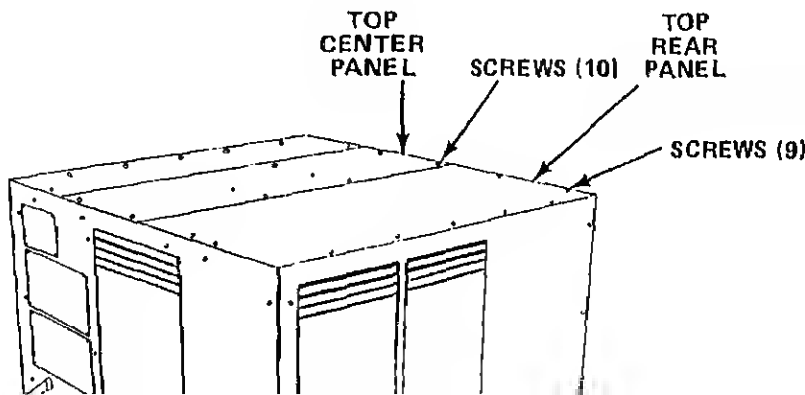
- | | |
|--------------|----|
| Removal | 3 |
| Test | 3 |
| Service | 72 |
| Repair | 6 |
| Installation | 3 |
| TOTAL TIME | 87 |

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL

1. Top Center Panel

- a. Remove ten (10) screws securing panel to top front and top rear panels.
- b. Remove top center panel.



2. Top Rear Panel

- a. Remove nine (9) screws securing panel to housing.
- b. Remove top rear panel.

3. Rear Panel

- a. Remove fourteen (14) screws securing panel to housing.
- b. Remove rear panel.

LEFT SIDE OF HOUSING

4. Left Side Panel

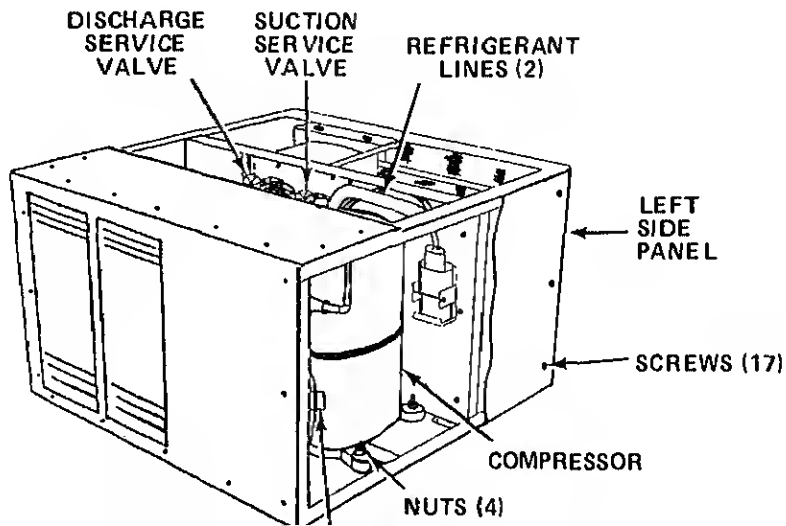
- a. Remove seventeen (17) screws securing side panel to housing.
- b. Remove left side panel.

NOTE

Testing of the compressor is to be done while the air conditioner is operating and supplying cooling air.

5. Refrigerant Servicing

Refer to paragraph 5-8 and discharge system.



suction refrigerant line to compressor.

- b.* Remove suction refrigerant line from compressor.
- c.* Unsolder and remove discharge line from compressor.
- d.* Remove four (4) nuts, capscrews and eight (8) flatwashers securing compressor to housing.
- e.* Tag and disconnect electrical leads from compressor.
- f.* Remove compressor from housing through left side.

- b. Open suction and discharge service valves.
- c. Operate the air conditioner in the cool mode and verify that the normal operating pressures are as follows:

Normal Operating Pressures

Outdoor Ambient Temperature
 125° F (51.6° C) 95° F (35° C)

At 90° F (32.2° C) DB or 80° F (26.7° C) WB

54-64 psi (374-443 kPa)
 230-260 psi (1592-1799 kPa)

At 80° F (26.7° C) DB or 67° F (19° C) WB

39-49 psi (270-339 kPa)
 160-185 psi (1107-1280 kPa)

- d. Stop air conditioner.
- e. Close suction and discharge service valves.
- f. Remove gauges.
- g. Operate the air conditioner in the cool mode and using a multimeter, measure insulation resistance of the compressor internal motor windings at the start relay selector switch.
- h. Verify that the insulation resistance between the windings and compressor frame is not less than 60 megohms.
- i. Verify that the insulation resistance of main winding (terminal pin A to C) is between .6 and .8 ohms.
- j. Verify that the insulation resistance of auxiliary winding (terminal pin A to B) is between 5 and 7 ohms.
- k. If testing indicates that the compressor is defective, remove or repair compressor.

- compressor.
- b. Flush out the entire refrigeration system. If the system is flushed and the problem follows or repeated burnouts will occur, the following steps should be followed:
- (1) Refer to paragraph 5-8 and flush the entire refrigerant system.
 - (2) Purge refrigerant system with dry nitrogen (paragraph 5-8).
 - (3) Remove defective compressor.
 - (4) With compressor removed, flush the entire refrigerant system with dry nitrogen (paragraph 5-8).
 - (5) Install new compressor.
 - (6) Install new dehydrator (paragraph 5-13).
 - (7) Discharge refrigerant system and evacuate system three times (paragraph 5-8).
 - (8) Start and operate air conditioner for twenty-four (24) hours (paragraph 5-13).
 - (9) Stop air conditioner (paragraph 5-13).
 - (10) Discharge refrigerant system and evacuate system with dry nitrogen (paragraph 5-8).
 - (11) Remove dehydrator and install new dehydrator (paragraph 5-13).
 - (12) Discharge refrigerant system and evacuate system and recharge with refrigerant (paragraph 5-8).
 - (13) Operate air conditioner.

Compressor

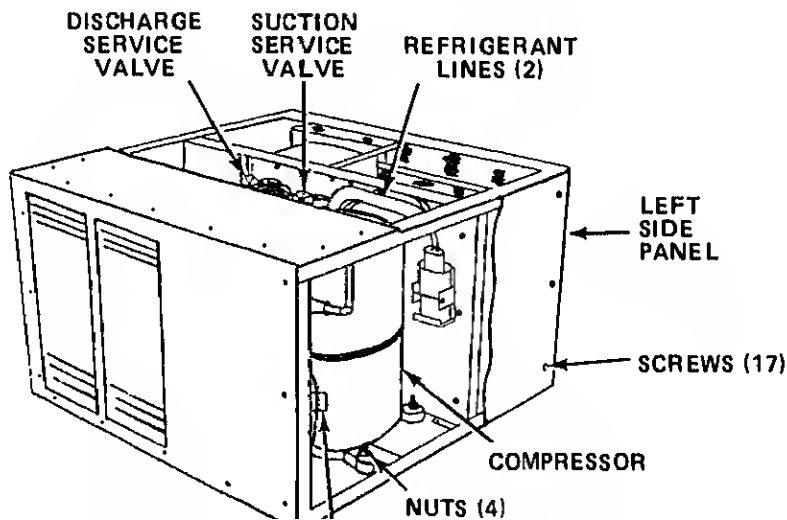
- a. Tighten loose connections.
- b. Repair damaged wiring by removing insulation to expose 1/2 inch of bare wire on each side of break.
- c. Twist the wire ends together and solder the splice.
- d. Cover the splice with PVC electrical tape, making certain to cover all repaired areas.

INSTALLATION

TOP AND LEFT SIDE OF HOUSING

1. Compressor

- a. Install compressor through left side of housing.
- b. Align holes in compressor mounting feet with holes in housing.
- c. Secure compressor with eight (8) flatwashers, four (4) capscrews and four (4) nuts.
- d. Install two (2) refrigerant lines on compressor and tighten flare nut on suction refrigerant line.
- e. Refer to paragraph 5-8 and solder discharge refrigerant line.



AND REAR OF HOUSING

Rear Panel

- a. Align holes in rear panel with housing.
- b. Secure rear panel with fourteen (14) screws.

Top Rear Panel

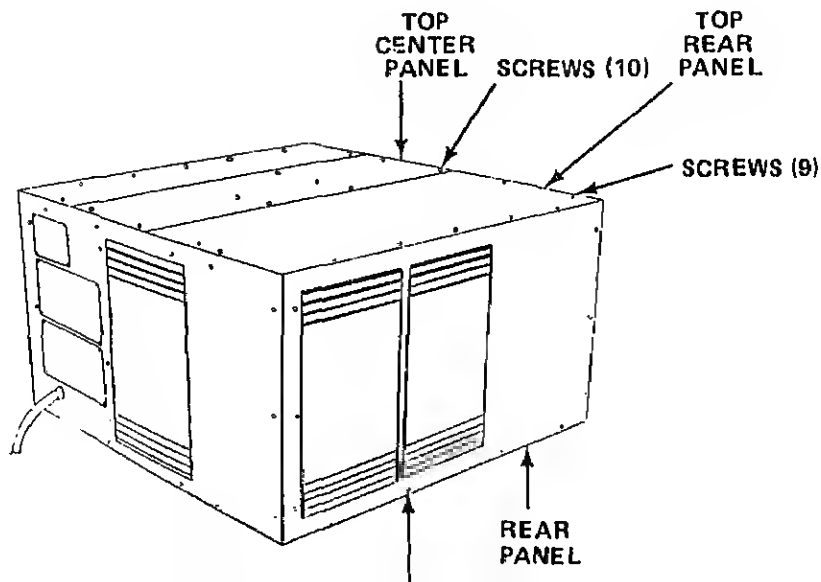
- a. Align holes in top rear panel with housing.
- b. Secure top rear panel with nine (9) screws.

Refrigerant System

Refer to paragraph 5-8 and charge refrigerant system. Refer to burnout procedure if a burnout has been detected.

Top Center Panel

- a. Align holes in top center panel with housing, top rear panel and top front panel.
- b. Secure top center panel with ten (10) screws.



INITIAL SETUP**Material/Parts**

Top Center Panel Screws (10)
 Top Front Panel Screws (7)
 Top Rear Panel Screws (9)
 Right Side Panel Screws (17)
 Rear Panel Screws (14)
 Left Side Panel Screws (17)
 Return Air Grill Screws (8)
 Air Diffuser Grill Screws (8)
 Control Panel Plate Screws (2)
 Front Panel Screws (14)

References

Paragraph 5-8

Troubleshooting Reference

AIR CONDITIONER, Malfunction 5, S

Approximate Time Required (in minutes)

Removal	20
Testing and Repair	30
Installation	750
TOTAL TIME	800

LOCATION/ITEM**REMARKS****ACTION****REMOVAL****TOP AND LEFT SIDE OF HOUSING**

1. Top Center Panel

- a. Remove ten screws securing top center panel.
- b. Remove top center panel.

2. Top Front Panel

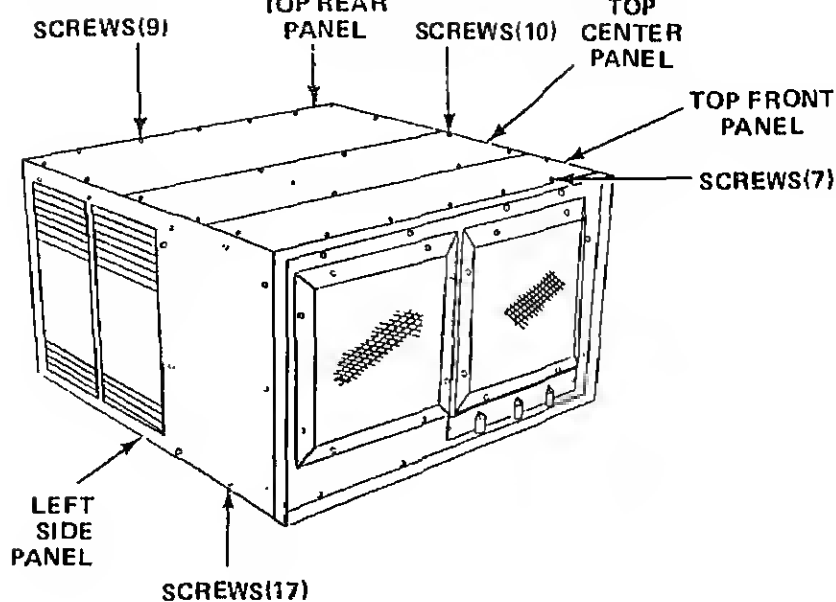
- a. Remove seven (7) screws securing top front panel.
- b. Remove top front panel.

3. Top Rear Panel

- a. Remove nine (9) screws securing top rear panel.
- b. Remove top rear panel.

4. Left Side Panel

- a. Remove seventeen (17) screws securing left side panel.
- b. Remove left side panel.



RIGHT SIDE AND REAR OF HOUSING

5. Right Side Panel

- a. Remove seventeen (17) screws side panel.
- b. Remove right side panel.

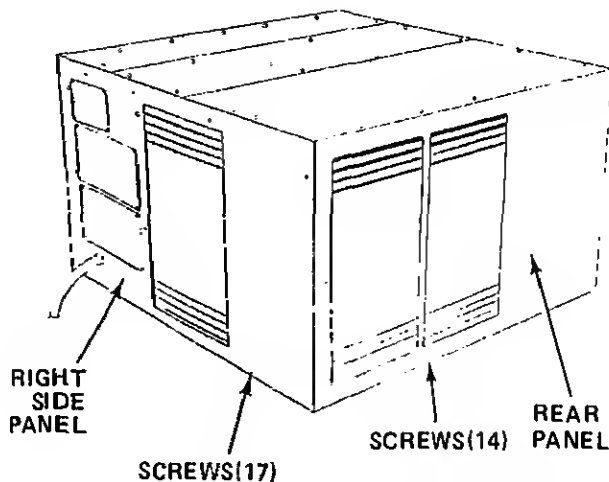
6. Rear Panel

- a. Remove fourteen (14) screws panel.
- b. Remove rear panel.

FRONT OF HOUSING

7. Control Panel Plate

- a. Loosen setscrews and remove fresh air control, selector thermostat switch.
- b. Remove two (2) screws securing plate.
- c. Remove control panel plate.



ONT OF HOUSING

Return Air Grill

- Loosen mechanical screw post at do remove wire.
- Loosen clamp on evaporator shro remove wire.
- Remove eight (8) screws securing re grill.
- Remove return air grill.

Air Diffuser Grill

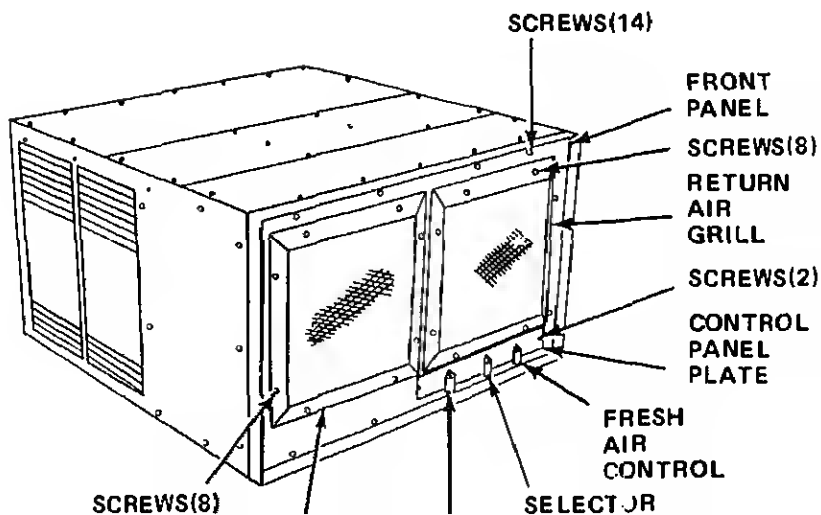
- Remove eight (8) screws securing air grill.
- Remove air diffuser grill.

Front Panel

- Remove two (2) screws securing the switch to front panel.
- Remove fourteen (14) screws securing panel.
- Remove front panel.

Refrigerant System

Refer to paragraph 5-8 and discharge ref system.



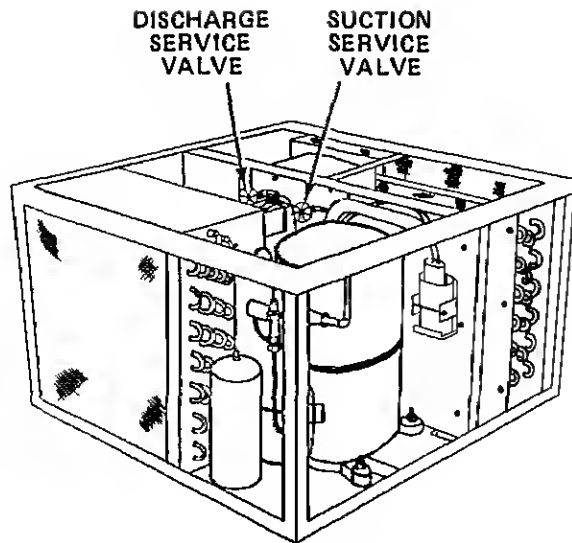
INTERIOR OF HOUSING

2. Service Valves

- a. Unscrew and remove flare nuts from suction and discharge service valves.
- b. Remove refrigerant lines from suction and discharge service valves.
- c. Remove two (2) screws from each service valve.
- d. Remove suction and discharge service valves.

3. Refrigerant Piping

- a. Unsolder and remove tubing only if necessary to remove a defective part.
- b. When soldering, constantly purge the refrigerant system with dry nitrogen to prevent scale formation within the refrigerant system (paragraph 5-8).



Valves

- a.* Visually inspect all valves for signs of damage.
- b.* Inspect all fittings for leaks.

INSTALLATION AND REPAIR

WARNING

Avoid bodily contact with liquid refrigerant and avoid inhaling refrigerant gas. Be especially careful that refrigerant does not come in contact with eyes. In case of refrigerant leaks, ventilate area immediately.

Refrigerant Piping

- a.* Check all piping and connections with a General Electrical Type H-2 Halogen Detector (or approved equal).
- b.* Calibrate the detector with a General Electrical LS-20 leak standard (or approved equal) to a pure refrigerant leak rate of 0.1 ounce per year.
- c.* Replace any piping or connection that is leaking.

INSTALLATION

Refrigerant Piping

- a.* Solder all copper-to-copper joints with solder type 3, 4 or 6A per specification QQ-S-561.
- b.* Solder all copper-to-brass or copper-to-steel joints with type 4 or 6A per specification QQ-S-561.
- c.* Solder melting point is 1160° F (625° C).
- d.* Make all solder joints with an atmosphere of inert gas to prevent internal oxidation.

Service Valves

- a.* Connect suction and discharge service valves to refrigerant piping.
- b.* Tighten flare nuts at suction and discharge service valves.
- c.* Secure suction and discharge service valves to bulkhead with four (4) screws.

FRONT OF HOUSING

Front Panel

- a.* Align holes in thermostat switch with holes in front panel.

ONT OF HOUSING

Air Diffuser Grill

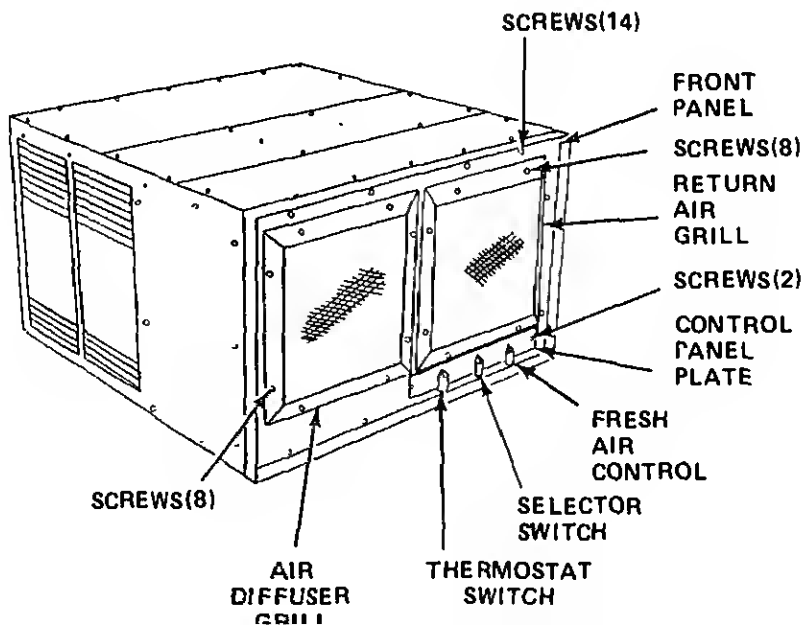
- a. Align holes in air diffuser grill with holes in front panel.
- b. Secure air diffuser grill with eight (8) screws.

Return Air Grill

- a. Align holes in return air grill with holes in front panel.
- b. Secure return air grill with eight (8) screws.
- c. Install wire through clamp on evaporator shroud and tighten clamp.
- d. Install wire in mechanical screw post on front panel and tighten mechanical screw post.

Control Panel Plate

- a. Align holes in control panel plate with holes in front panel.
- b. Secure control panel plate with two screws.
- c. Install three (3) knobs.

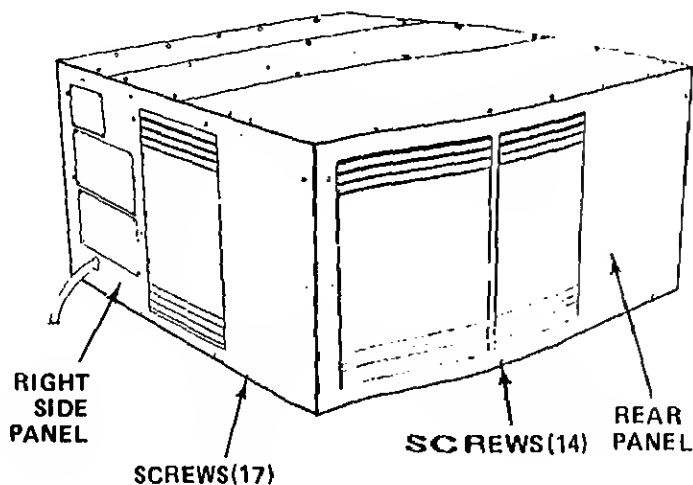


SIDE AND REAR OF HOUSING

Front Panel

Right Side Panel

- a.* Align holes in rear panel with housing.
- b.* Secure rear panel with fourteen (14) screws.
- a.* Align holes in right side panel with housing.
- b.* Secure right side panel with seventeen screws.



housing.
b. Secure left side panel with screws.

26. Top Rear Panel

a. Align holes in top rear panel with housing.
b. Secure top rear panel with nine screws.

27. Top Front Panel

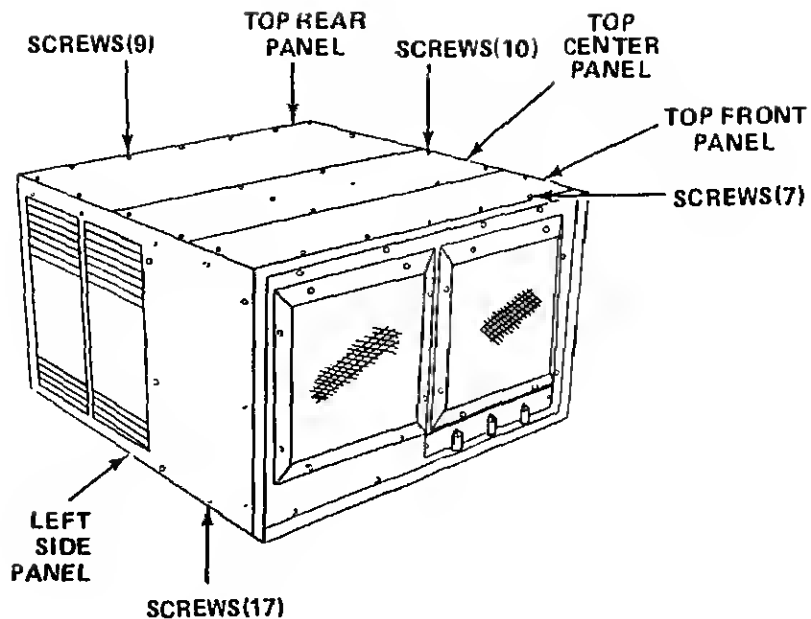
a. Align holes in top front panel with housing.
b. Secure top front panel with screws.

28. Refrigerant Servicing

Refer to paragraph 5-8 and chapter 5 for servicing the refrigerant system.

29. Top Center Panel

a. Align holes in top center panel with top front and top rear panels.
b. Secure top center panel with screws.



Material/Parts

Top Center Panel Screws (10)
 Top Front Panel Screws (7)
 Top Rear Panel Screws (9)
 Right Side Panel Screws (17)
 Rear Panel Screws (14)
 Left Side Panel Screws (17)
 Thermostat Switch Screws (2)
 Selector Switch Screws (2)
 Control Panel Plate Screws (2)
 Front Panel Screws (14)
 Condenser Shroud Screws (2)
 Frame Screws (8)
 Evaporator Coil Screws (6)
 Evaporator Coil Screws (4)

References

Paragraph 5-8

Troubleshooting Reference

None

Approximate Time Required (in minutes)

Removal	30
Test	20
Repair	20
Installation	720
TOTAL TIME	790

LOCATION/ITEM

REMARKS

ACTION

REMOVAL

TOP AND LEFT SIDE OF HOUSING

1. Top Center Panel

- Remove ten (10) screws securing top panel.
- Remove top center panel.

2. Top Front Panel

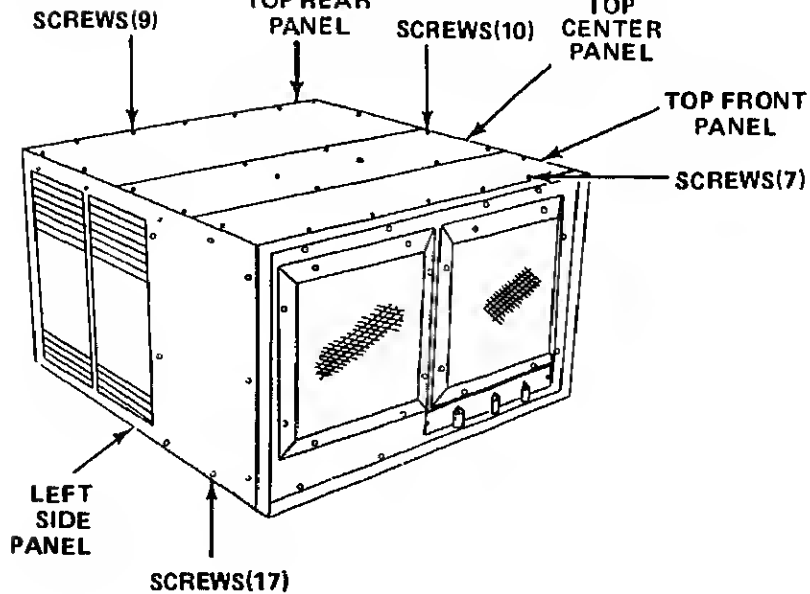
- Remove seven (7) screws securing top panel.
- Remove top front panel.

3. Top Rear Panel

- Remove nine (9) screws securing top panel.
- Remove top rear panel.

4. Left Side Panel

- Remove seventeen (17) screws securing left side panel.
- Remove left side panel.



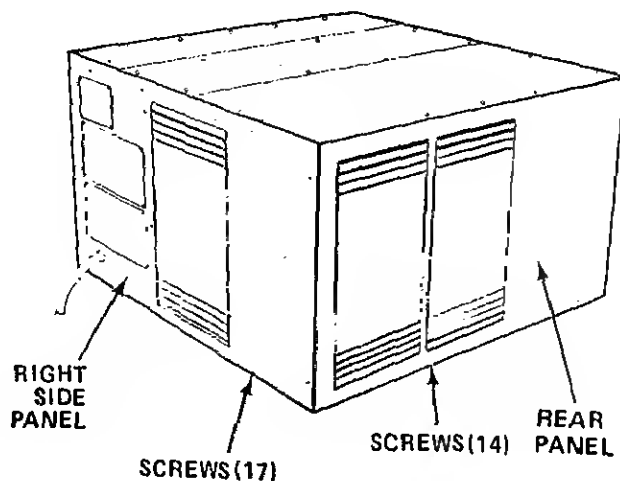
RIGHT SIDE AND REAR OF HOUSING

Right Side Panel

- a.* Remove seventeen (17) screws securing side panel.
- b.* Remove right side panel.

Rear Panel

- a.* Remove fourteen (14) screws securing panel.
- b.* Remove rear panel.



FRONT OF HOUSING

7. Control Panel Plate

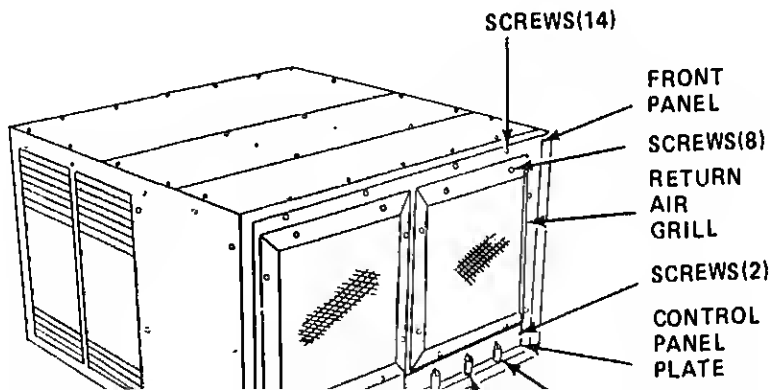
- a. Loosen setscrews and remove knobs fresh air control, selector switch thermostat switch.
- b. Remove two (2) screws securing control plate.
- c. Remove control panel plate.

8. Front Panel

- a. Loosen mechanical screw post at door remove wire.
- b. Loosen clamp on evaporator shroud remove wire.
- c. Remove two (2) screws securing thermostat switch to front panel.
- d. Remove two (2) screws securing selector switch to front panel.
- e. Remove fourteen (14) screws securing front panel.
- f. Remove front panel.

NOTE

Test evaporator coil for leaks prior to discharging refrigerant system and removing evaporator coil.



- b.* Remove screw on top of frame securing suction line clamp.
- c.* Remove eight (8) screws securing frame base.
- d.* Remove frame from base.
- e.* Remove air filter.
- f.* Unsolder suction line approximately two inches below header and remove suction line from evaporator coil.
- g.* Unscrew and remove flare nut between expansion valve and evaporator coil.
- h.* Remove six (6) screws securing evaporator coil to bulkhead.
- i.* Remove four (4) screws from underside of base that secure evaporator coil to base.
- j.* Remove evaporator coil.

TESTING

9. Evaporator Coil

- a.* Check all evaporator coil tubing and fittings with a General Electric Type Halogen Test Detector (or approved equivalent).
- b.* Calibrate the detector with a General Electric LS-20 leak standard (or approved equivalent) pure refrigerant leak rate of 0.1 ounce per year.
- c.* Mark all spots where leaks are noticed.
- d.* Repair leaks or replace evaporator coil.

FRAME
SCREWS (2)

BASE

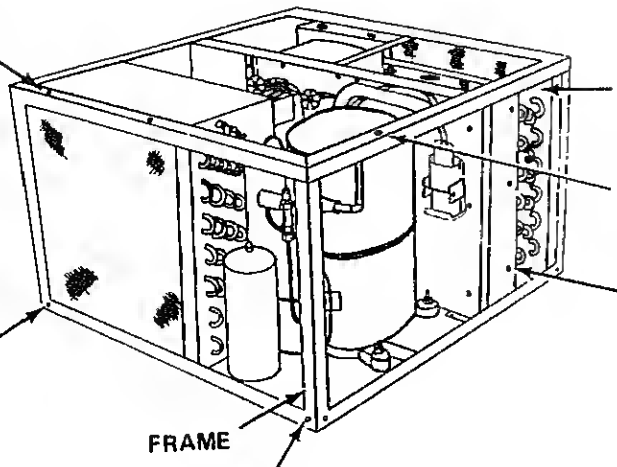
FRAME

FRAME
SCREWS (8)

EVAPORATOR
COIL

SUCTION LINE CLAMP
SCREW

EVAPORATOR
COIL SCREWS (6)



AIR

Evaporator Coil

- a. Repair minor leaks or holes by soldering.
- b. Use a silver solder with a 50% silver content and a melting point of approximately 1 (634.8°C).
- c. Straighten bent fins prior to installation.

STALLATION

USING INTERIOR

Evaporator Coil

- a. Align holes in evaporator coil with holes in base.
- b. Secure evaporator coil to base from underside using four (4) screws.
- c. Secure evaporator coil to bulkhead with six (6) screws.
- d. Connect and solder two (2) refrigerant lines to evaporator coil.
- e. Align holes in frame with holes in base.
- f. Secure frame to base with eight (8) screws.
- g. Secure frame to condenser coil with two (2) screws.
- h. Connect suction line to evaporator coil approximately two (2) inches below liquid line.
- i. Refer to paragraph 5-8 and solder suction line.
- j. Connect refrigerant line between evaporator coil and expansion valve and tighten flange.

STALLATION

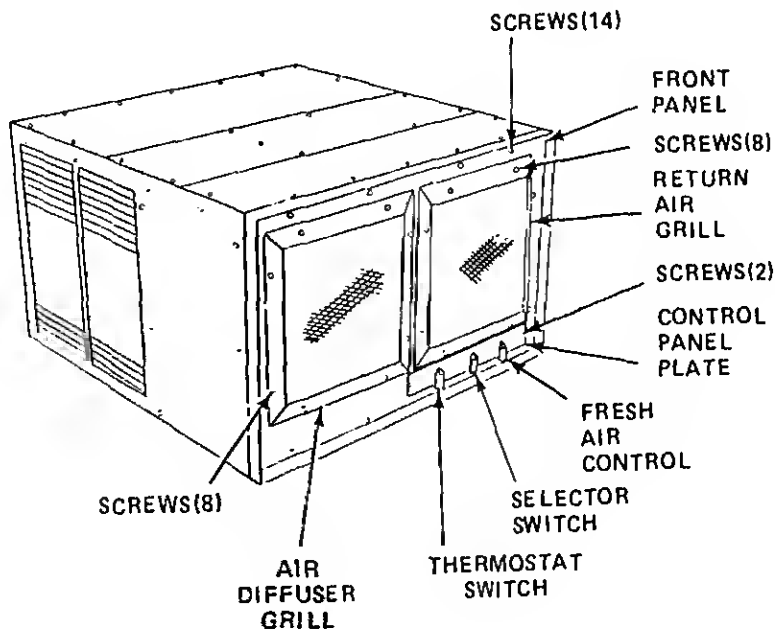
ONT OF HOUSING

Front Panel

- a. Align holes in thermostat switch with holes in front panel.
- b. Secure thermostat switch to front panel with two (2) screws.
- c. Align holes in selector switch with holes in front panel.
- d. Secure selector switch to front panel with two (2) screws.
- e. Align holes in front panel with holes in housing.

INSTALLATION**FRONT OF HOUSING****4. Control Panel Plate**

- a. Align holes in control panel plate with in front panel.
- b. Secure control panel plate with two screws.
- c. Install three (3) knobs.



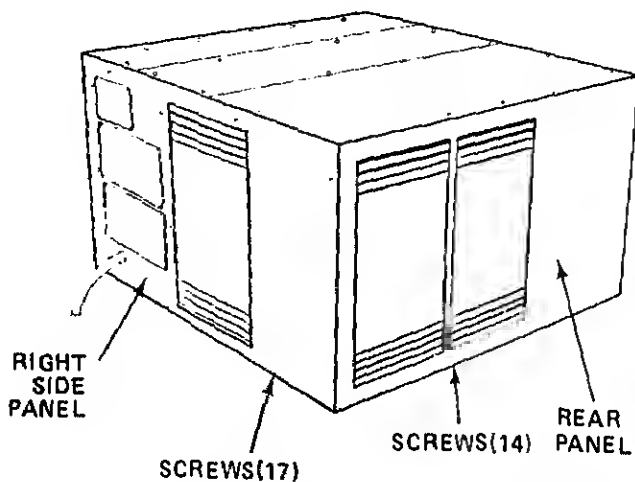
RIGHT SIDE AND REAR OF HOUSING

15. Rear Panel

- a. Align holes in rear panel with housing.
- b. Secure rear panel with fourteen (14)

16. Right Side Panel

- a. Align holes in right side panel with housing.
- b. Secure right side panel with seventeen (17) screws.



TOP AND LEFT SIDE OF HOUSING

17. Left Side Panel

- a. Align holes in left side panel with housing.
- b. Secure left side panel with seven screws.

18. Top Rear Panel

- a. Align holes in top rear panel with housing.
- b. Secure top rear panel with nine (9) screws.

19. Top Front Panel

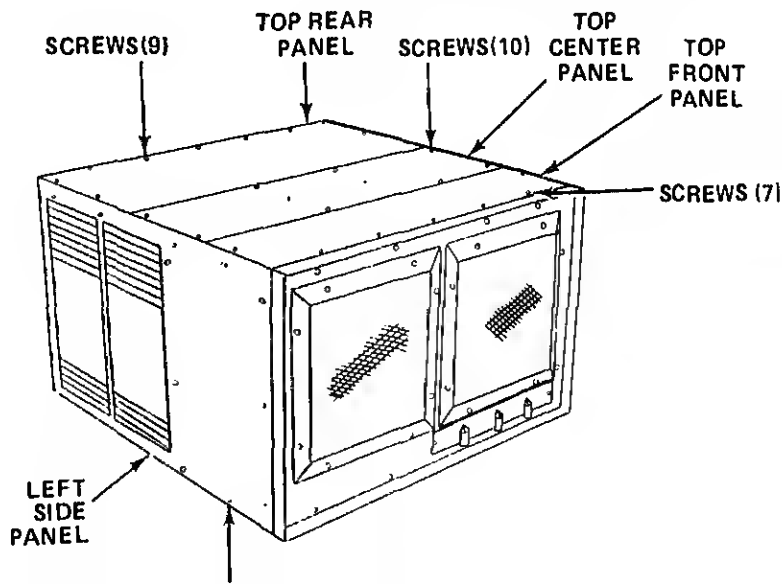
- a. Align holes in top front panel with housing.
- b. Secure top front panel with seven (7) screws.

20. Refrigerant Servicing

Refer to paragraph 5-8 and charge refrigerant system.

21. Top Center Panel

- a. Align holes in top center panel with top front and top rear panels.
- b. Secure top center panel with ten (10) screws.



a. Removal
b. Test

c. Repair
d. Installation

INITIAL SETUP

Material/Parts

Top Center Panel Screws (10)
Top Rear Panel Screws (9)
Left Side Panel Screws (17)
Rear Panel Screws (14)
Condenser Shroud Screws (2)
Condenser Shroud Screws (6)
Condenser Coil Screws (4)

References

Paragraph 5-8

Troubleshooting Reference
None

Approximate Time Required (in min)
Removal
Test
Repair
Installation
TOTAL TIME

LOCATION/ITEM

REMARKS

ACTION

REMOVAL

TOP AND LEFT SIDE OF HOUSING

1. Top Center Panel

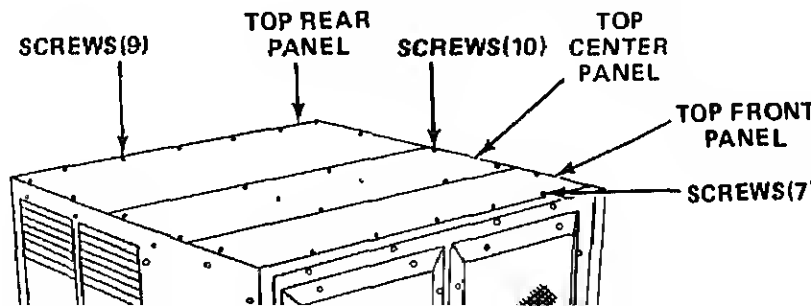
- a. Remove ten (10) screws securing panel.
- b. Remove top center panel.

2. Top Rear Panel

- a. Remove nine (9) screws securing panel.
- b. Remove top rear panel.

3. Left Side Panel

- a. Remove seventeen (17) screws securing side panel.
- b. Remove left side panel.



VAL
OF HOUSING

Panel

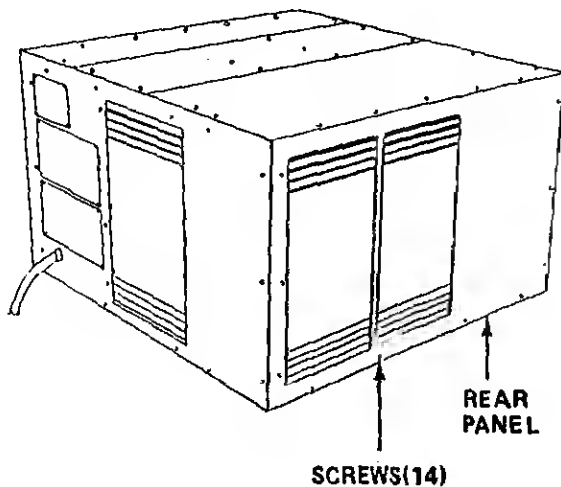
- a. Remove fourteen (14) screws securing rear panel.
- b. Remove rear panel.

NOTE

Test condenser coil for leaks prior to *discharging* refrigerant system and removing condenser coil.

gerant System

Refer to paragraph 5-8 and discharge refrigerant system.



INSIDING INTERIOR

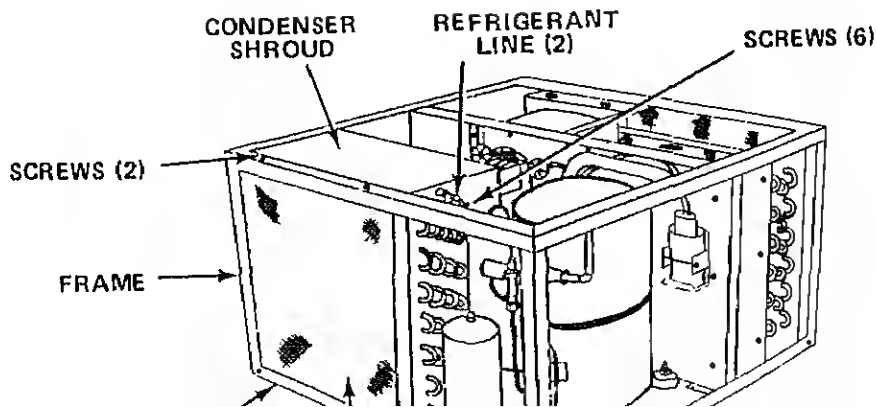
Condenser Coil

- a. Loosen setscrew in hub of condenser fan, slide condenser fan towards bulkhead.
- b. Remove two (2) screws securing fan to condenser shroud.
- c. Remove six (6) screws securing condenser shroud to condenser coil.
- d. Slide condenser shroud back towards bulkhead.
- e. Unsolder and remove two (2) refrigerant lines from condenser coil.
- f. Remove four (4) screws from under base that secures condenser coil to base.
- g. Remove condenser coil.

TESTING

Condenser Coil

- a. Check all condenser coil tubing and fittings with a General Electric T-10 Halogen Test Detector (or approved equivalent).
- b. Calibrate the detector with a General Electric LS-20 leak standard (or approved equivalent) to a pure refrigerant leak rate of 0.1 cc per year.
- c. Mark all spots where leaks are noticed.
- d. Repair leaks or replace condenser coil.



Condenser Coil

- a. Repair minor leaks or holes by soldering.
- b. Use a silver solder with a 50% silver cap and a melting point of approximately 1111° F (634.8° C).
- c. Straighten bent fins prior to installation.

WARNING

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200° F creates phosgene gas.

INSTALLATION

Condenser Coil

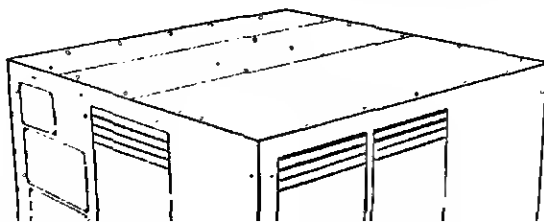
- a. Align holes in condenser coil with holes in base.
- b. Secure condenser coil to base from underside with four (4) screws.
- c. Align holes in condenser shroud with holes in condenser coil.
- d. Secure condenser shroud with six (6) screws.
- e. Secure condenser shroud to frame with four (4) screws.
- f. Reposition condenser fan on motor until hub is flush with end of shaft and tighten setscrew in hub.
- g. Refer to paragraph 5-8 and solder two (2) refrigerant lines to condenser coil.

INSTALLATION

REAR OF HOUSING

10. Rear Panel

- a. Align holes in rear panel with holes in housing.
- b. Secure rear panel with fourteen (14) screws.



AND LEFT SIDE OF HOUSING

Left Side Panel

- a.* Align holes in left side panel with housing.
- b.* Secure left side panel with seventeen screws.

Top Rear Panel

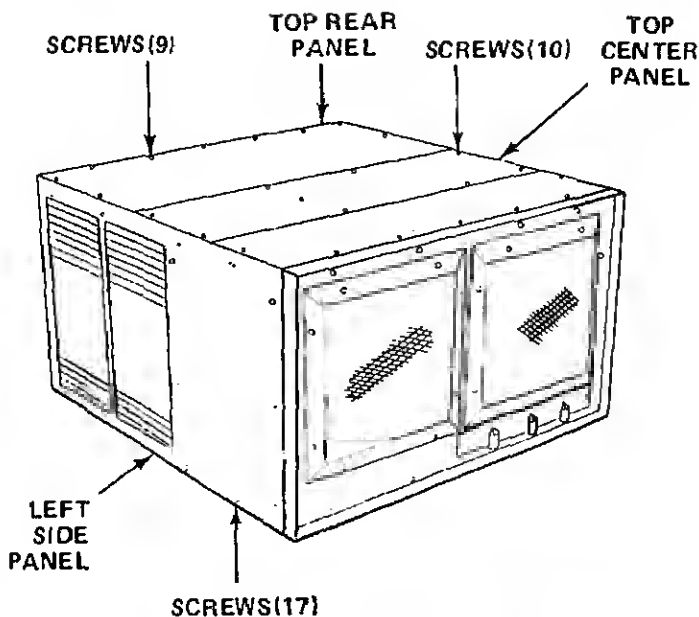
- a.* Align holes in top rear panel with housing.
- b.* Secure top rear panel with nine (9) screws.

Refrigerant Servicing

Refer to paragraph 5-8 and charge refrigerant system.

Top Center Panel

- a.* Align holes in top center panel with top front and top rear panels.
- b.* Secure top center panel with ten (10) screws.



INITIAL SETUP

Material/Parts

Right Side Panel Screws (17)
Return Air Grill Screws (8)

Troubleshooting Reference

AIR CONDITIONER, Malfunction 3, S
AIR CONDITIONER, Malfunction 4, S

References

Paragraph 5-8

Approximate Time Required (in minutes)

Removal	10
Installation	740
TOTAL TIME	750

LOCATION/ITEM

REMARKS

ACTION

REMOVAL

RIGHT SIDE OF HOUSING

1. Right Side Panel

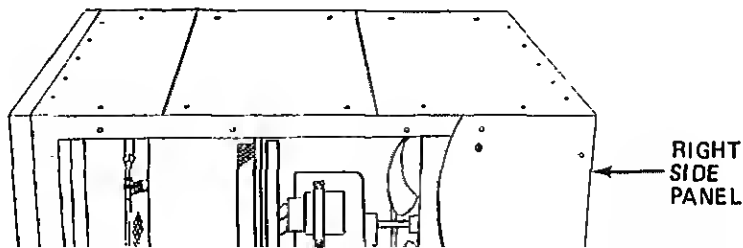
- a. Remove seventeen (17) screws securing side panel to housing.
- b. Remove right side panel.

2. Return Air Grill

- a. Loosen setscrew and remove fresh air knob.
- b. Remove eight (8) screws securing return air grill to front panel.
- c. Partially remove return air grill.

3. Refrigerant System

Refer to paragraph 5-8 and discharge refrigerant system.



INSTALLATION

Dehydrator

Right Side Panel

Return Air Grill

Refrigerant Servicing

- (2) refrigerant lines from dehydrator.
 - b.* Remove dehydrator from air conditioning unit.
 - a.* Connect dehydrator to two (2) refrigerant lines.
 - b.* Tighten two (2) flare nuts at dehydrator.
 - a.* Align holes in right side panel with housing.
 - b.* Secure right side panel with seventeen (17) screws.
 - a.* Align holes in return air grill with front panel.
 - b.* Secure return air grill with eight (8) screws.
 - c.* Install knob on fresh air control and setscrew.
- Refer to paragraph 5-8 and charge refrigerant system.

a. Removal

b. Installation

INITIAL SETUP

Material/Parts

Rear Panel Screws (14)

Troubleshooting Reference

None

Approximate Time Required (in minutes)

Removal 10

Installation 740

TOTAL TIME 750

LOCATION/ITEM

REMARKS

ACTION

REMOVAL

REAR OF HOUSING

1. Rear Panel

a. Remove fourteen (14) screws securing rear panel to housing.

b. Remove rear panel.

2. Refrigerant System

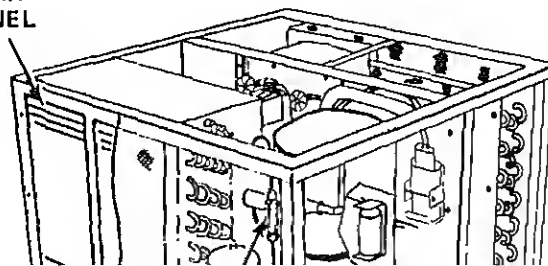
Refer to paragraph 5-8 and discharge refrigerant from system.

3. Sight Glass

a. Unscrew two (2) flare nuts and remove (2) refrigerant lines from sight glass.

b. Remove sight glass from air conditioning unit.

REAR
PANEL



5. Sight Glass

a Connect sight glass to two (2) refrigerant lines.

b Tighten two (2) flare nuts at sight glass.

6. Rear Panel

a Align holes in rear panel with mounting housing.

b Secure rear panel with fourteen (14) screws.

6. Refrigerant System

Refer to paragraph 5-8 and charge refrigerant system.

This task covers:

- a. Removal
- b. Test

c. Installation

INITIAL SETUP

Material/Parts

Top Center Panel Screws (10)
Top Front Panel Screws (7)
Right Side Panel Screws (17)
Insulation Tape

Troubleshooting Reference

AIR CONDITIONER, Malfunction 3, 9
AIR CONDITIONER, Malfunction 4, 9
AIR CONDITIONER, Malfunction 5, 9

Approximate Time Required (in minutes)

Removal	10
Test	10
Installation	730
TOTAL TIME	750

References

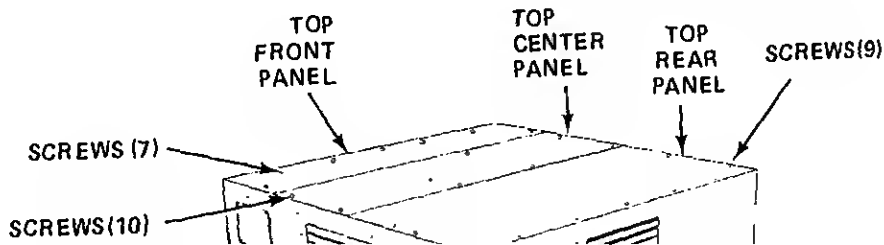
Paragraph 5-8

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL

TOP AND RIGHT SIDE OF HOUSING

- | | |
|---------------------|---|
| 1. Top Center Panel | a. Remove ten (10) screws securing top panel.
b. Remove top center panel. |
| 2. Top Front Panel | a. Remove seven (7) screws securing top panel.
b. Remove top front panel. |
| 3. Right Side Panel | a. Remove seventeen (17) screws securing side panel.
b. Remove right side panel. |



- a. Turn clockwise to remove return air grill knob.
- b. Remove eight (8) screws securing return grill to front panel.
- c. Partially remove return air grill.

NOTE

Testing of expansion valve is to be done while the air conditioner is operating and supplying cooling air.

Refrigerant System

Refer to paragraph 5-8 and discharge refrigerant system.

CAUTION

Carefully unwrap thermostat switch sensing bulb from expansion valve sensing line. Use care to prevent damage to sensing bulb.

Expansion Valve

- a. Unwrap insulation tape from sensing bulb.
- b. Mark location and remove two (2) metal straps securing sensing bulb.
- c. Carefully unwrap thermostat switch sensing bulb from expansion valve sensing line.
- d. Unscrew and remove two (2) flare nuts. Remove refrigerant lines from expansion valve.
- e. Remove expansion valve.

TESTING

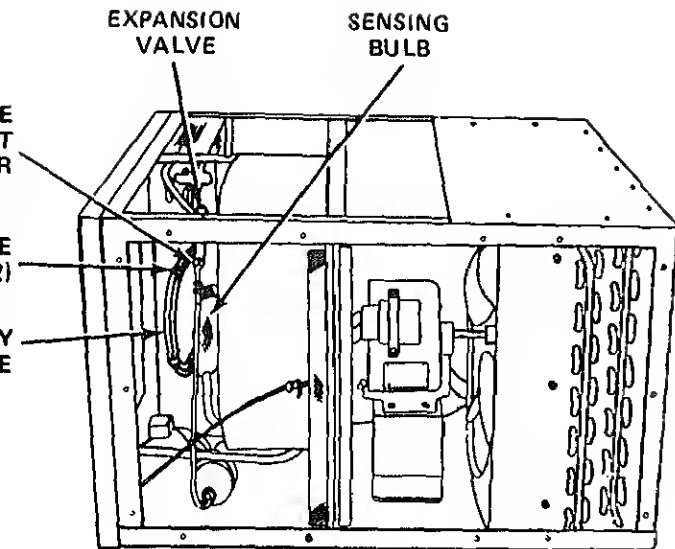
Expansion Valve

- a. Using a General Electric Type H-2 Halogen Test Detector (or approved equal), test expansion valve for leaks.
- b. Calibrate the detector with a General Electric LS-20 leak standard (or approved equal) to pure refrigerant leak rate of 0.1 ounce per year.
- c. Verify that there is NO leakage or damage.
- d. Replace expansion valve if testing indicates that it is defective.

INSTALLATION

Expansion Valve

- a. Connect expansion valve to refrigerant line.
- b. Tighten two (2) flare nuts.
- c. Secure sensing bulb to refrigerant line with two (2) metal straps.



ITEM	REMARKS	ACTION
------	---------	--------

IDE OF HOUSING

- a. Align holes in return air grill with holes in front panel.
- b. Secure return air grill to front panel with eight (8) screws.
- a. Align holes in right side panel with holes in housing.
- b. Secure right side panel with seventeen (17) screws.

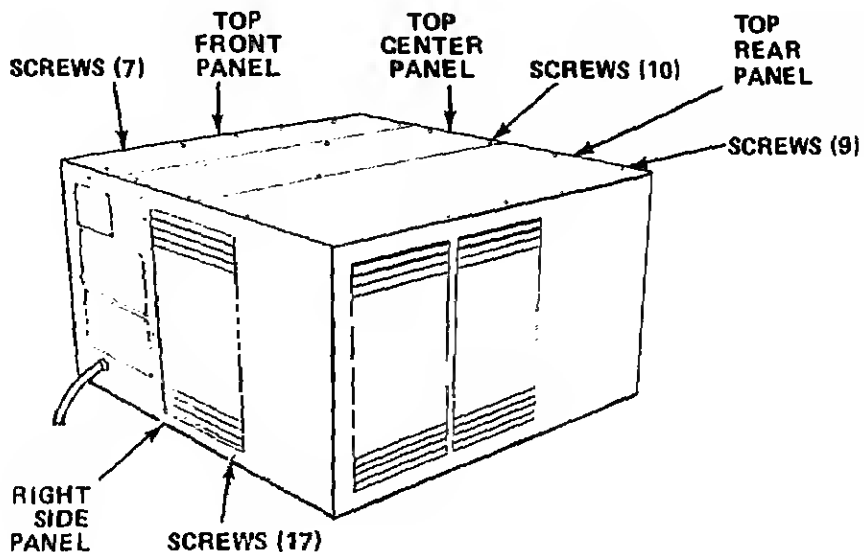
TOP AND RIGHT SIDE OF HOUSING

12. Refrigerant Servicing

Refer to paragraph 5-8 and charge system.

13. Top Center Panel

- a. Align holes in top center panel with top front and top rear panels.
- b. Secure top center panel with ten



TB 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users
LUBRICATION	
C91001L	Fuels, Lubricants, Oil and Waxes
PAINTING	
TM-43-0139	Painting Instructions for Field Use
MAINTENANCE	
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 5-4120-341-23P	Organizational and Direct Support Maintenance Repair Parts and Spec Tools List
CLEANING	
Fed Spec P-S-661	Dry Cleaning Solvent
Fed Spec P-D-680	Dry Cleaning Solvent
DESTRUCTION	
TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use
SHIPMENT AND STORAGE	
TM 740-90-1	Administrative Storage of Equipment
RADIO SUPPRESSION	
FM 11-65	Radio Interference Suppression

Section I. INTRODUCTION

1. SCOPE

This appendix lists Integral Components of and Basic Issue Items (BII) for the air conditioner to help identify inventory items required for safe and efficient operation.

2. GENERAL

The components of end item list are divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the air conditioner and must accompany it whenever it is transferred or turned in. These illustrations will help identify these items.

b. Section III. Basic Issue Items. These are minimum essential items required to place the air conditioner in operation, to operate it and to perform emergency repairs. Although shipped separately, they must accompany the air conditioner during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII based on Table(s) of Organization and Equipment (TOE)/Modification Table of Organization and Equipment (MTOE) authorization of the end item.

3. EXPLANATION OF COLUMNS

a. Illustration. This column is divided as follows:

(1) Figure Number. Indicates the figure number of the illustration on which the item is shown (if applicable).

(2) Item Number. The number used to identify item called out in the illustration.

b. National Stock Number (NSN). Indicates the national stock number assigned to the end item which will be used for requisitioning.

c. Part Number (P/N). Indicates the primary number used by the manufacturer which controls design and characteristics of the item by means of its engineering drawings, specifications, standards and inspection requirements to identify an item or range of items.

d. Description. Indicates the federal item name and, if required, a minimum description to identify the item.

e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

Section 1. INTRODUCTION

1. GENERAL

- a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.
- b. Section II designates overall responsibility for the performance of maintenance functions on identified end item or component and the work measurement time required to perform the functions at the designated maintenance level. The implementation of the maintenance functions upon the end item or components will be consistent with the assigned maintenance functions.
- c. Section III lists the tools and test equipment required for each maintenance function as referenced in Section II (Not Applicable).

2. EXPLANATION OF COLUMNS IN SECTION II

a. *Column (1), Group Number.* Column 1 lists group numbers to identify related components, assemblies, subassemblies, and modules with their next higher assembly. The applicable groups are listed in the MAC in disassembly sequence beginning with the first group removed.

b. *Column (2), Component/Assembly.* This column contains the noun names of components, assemblies, subassemblies and modules for which maintenance is authorized.

c. *Column (3), Maintenance Functions.* This column lists the functions to be performed on the item listed in Column 2. The maintenance functions are defined as follows:

(1) *Inspect.* To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards through examination.

(2) *Test.* To verify serviceability and to detect incipient failure by measuring the mechanical and electrical characteristics of an item, and comparing those characteristics with prescribed standards.

(3) *Service.* Operations required periodically to keep an item in proper operating condition, to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, and compressed air supplies.

(4) *Adjust.* To maintain within prescribed limits, by bringing into proper or exact position, or setting the operating characteristics to specified parameters.

(5) *Align.* To adjust specified variable elements of an item to bring about optimum or desired performance.

(6) *Calibrate.* To determine and cause corrections to be made or to be adjusted on instrumented test measuring and diagnostic equipments used in precision measurement. Consist of comparison of instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancies.

...ing, to restore serviceability to an item by correcting specific defects in a part, sub-assembly, module (component or assembly), end item, or system.

(10) *Overhaul*. That maintenance effort (service/action) necessary to restore an item to completely serviceable/operational condition as prescribed by maintenance standards in approved technical manuals. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to a like new condition.

(11) *Rebuild*. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the returning to zero those age measurements (hours/miles, etc.) considered in classifying equipment/components.

d. *Column (4), Maintenance Level*. This column is made up of sub-columns for each category of maintenance. Work time figures are listed in these sub-columns for the lowest level of maintenance authorized to perform the function listed in column 3. These figures indicate the average active time required to perform the maintenance function at the indicated category of maintenance under typical operating conditions.

e. *Column (5), Tools and Equipment*. This column is provided for referencing by code, the complete sets (not individual tools) special tools, test and support equipment required to perform the design functions (Not Applicable).

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT
			C	O	F	H	D	
	HOUSING							
	Panels, Grills	Inspect	X					
		Repair		X				
		Replace		X				
		Adjust	X					
		Service	X					
	Drains	Inspect	X					
		Service	X					
	FILTER							
	Air Filter	Inspect		X				
		Service		X				
		Replace		X				
	ELECTRIC MOTOR AND FANS							
	Motor	Inspect		X				
		Test		X				
		Repair		X				
		Replace		X				
	Fans	Inspect		X				
		Repair		X				
		Replace		X				
	STARTING AND PROTECTIVE DEVICE							
	Switches	Inspect	X					
		Test		X				
		Replace		X				
	Capacitors	Test		X				
		Replace		X				
	Start Relay	Test		X				

9,000 BTU/HR Conventional Air Conditioner

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					TC EC
			C	O	F	H	D	
05	WIRING							
	Misc. Wiring	Inspect Test Repair Replace		X X X X				
06	GAS COMPRESSOR, PIPING AND COMPONENTS							
	Compressor	Inspect (1) Test Service Repair Replace		X	X X X X			
	Refrigerant Piping and Service Valves	Inspect (1) Test Repair Replace		X	X X X			
	Evaporator Coil	Inspect Service Test Repair Replace		X X	X X X			
	Condensor Coil	Inspect Service Test Repair Replace		X X	X X X			
	Dehydrator	Replace			X			

Note 1

Inspect components externally only,

COPE

pendix I lists additional items you are authorized for the support of the air conditioner.

GENERAL

st identifies items that do not have to accompany the air conditioner and that do not have to be
in with it. These items are authorized to you by CTA, MTOE, TDA or JTA.

EXPLANATION OF LISTING

al stock number, descriptions, and quantities are provided to help you identify and request the
nal items you require to support this equipment. "USABLE ON" codes are identified as follows:

Code

Used On

Not Applicable

Section 1. INTRODUCTION

E-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain your vehicle.

These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Classification 1, and Heraldic Items).

E-2. EXPLANATION OF COLUMNS

a. Column 1, Item Number. This number is assigned to the entry in the listing and is referred to in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

b. Column 2, Level. This column identifies the lowest level of maintenance that requires the item.

C - Operator/Crew

O - Organizational Maintenance

F - Direct Support Maintenance

H - General Support Maintenance

c. Column 3, National Stock Number. This is the National stock number assigned to the item. It is used to request or requisition the item.

d. Column 4, Description. Indicates the Federal item name and, if required, a description of the item. The last line for each item indicates the part number followed by the Federal Supply Manufacturer (FSCM) in parenthesis, if applicable.

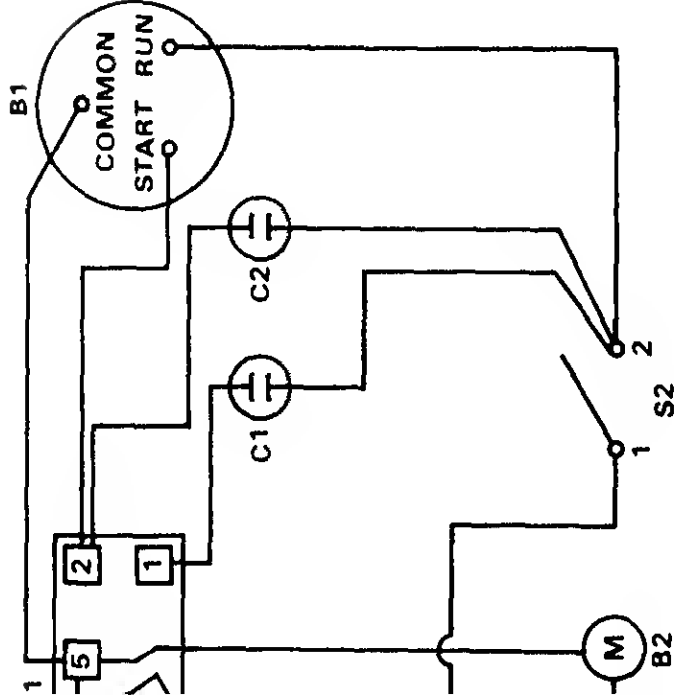
e. Column 5, Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy the requirements.

1	O	Coater, Air Filter
2	O	Dry Cleaning Solvent, P-D-680
3	O	Dry Cleaning Solvent, P-S-661
4	O	Adhesive
5	F	Refrigerant

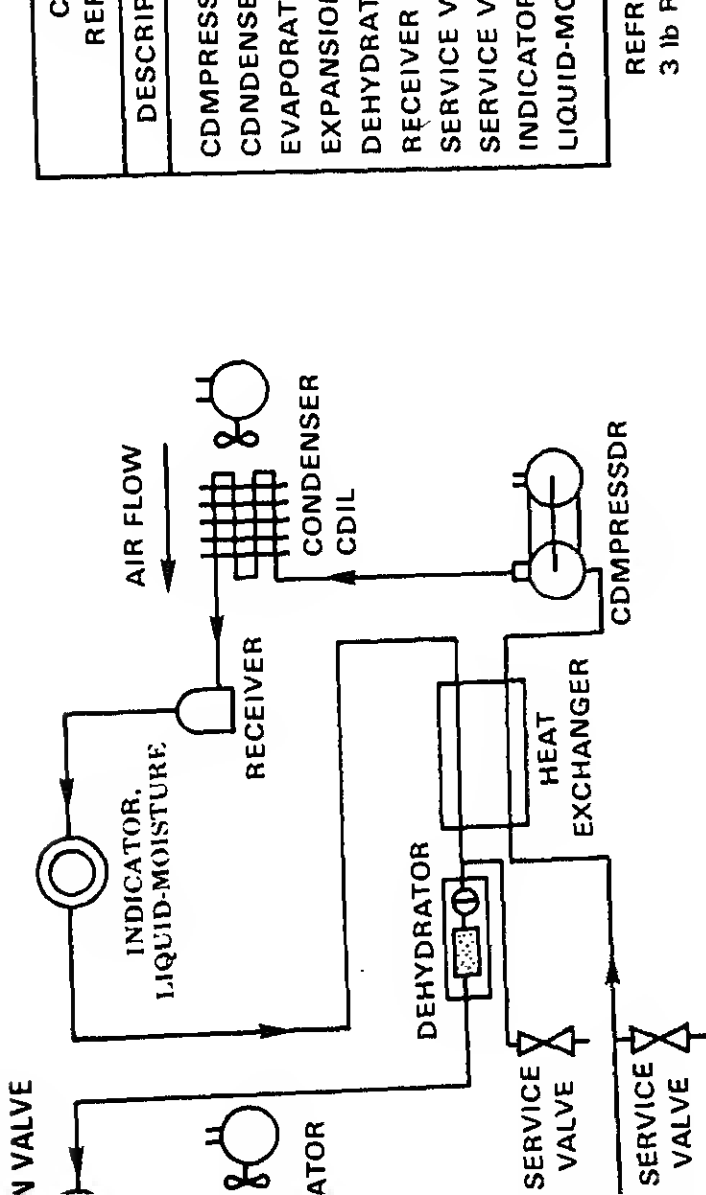
ing diagram for the air conditioner is shown in figure F-1.

REFRIGERANT SYSTEM DIAGRAM

gerant system diagram for the air conditioner is shown in figure F-2.



REF DES	COM REFER	
	DESCRIPTION	
S1	SELECTOR SW	
B1	COMPRESSOR	
S2	THERMOSTAT	
C2	RUN CAPACIT	
C1	START CAPAC	
K1	START RELAY	
B2	A.C. MOTOR	



REF	DESCRIPTION
CDMPRESSDR	COMPRESSOR
CONDIL	CONDENSER
RECEIVER	RECEIVER
DEHYDRATOR	DEHYDRATOR
HEAT EXCHANGER	HEAT EXCHANGER
EVAPORATOR	EVAPORATOR
INDICATOR-MOISTURE	INDICATOR-MOISTURE

REFR
3 lb F

Figure F-2. Refrigeration diagram.

C

in	4.2
ls and Equipment	4.30
il	4-33,
n	4.4
Materials	
Switches	
.	

D

f Army Material to Prevent Enemy Use	
etween Models	
t Troubleshooting Table	
.	

E

oil	4-32,
ive	4-35,

F

Check	
-----------------	--

H

s	
ls and Grills	

I

nents	
-----------------	--

L

Performance Data	
Direct Support Maintenance	4-34
Organizational Maintenance	4-35
Position the Unit	4-36
Power Source, Connect	4-37
Preventive Maintenance Checks and Services (PMCS)	4-38
Purpose of Air Conditioner	4-39

R

Refrigerant	
Piping	4-40
Piping and Service Valves	4-41
Servicing	4-42
Reporting Equipment Improvements Recommendation (RIPS)	4-43
Return Air Grill Check	4-44
Run Capacitor	4-45

S

Select Switch	4-46
Service Upon REceipt Checklist	4-47
Sight Glass	4-34, 4-48
Special Tools and Test Equipment	4-35
Start Capacitor	4-49
Start Relay	4-50
Starting	
Operating Instructions for Cooling	4-51
Operating Instructions for Ventilation	4-52
Startup Instructions	4-53

T

Thermostat Switch	4-54
Troubleshooting Table	4-55

V

Ventilation	4-56
-------------	------

J. C. PENNINGTON

Major General, United States Army

The Adjutant General

TRIBUTION:

to be distributed in accordance with DA Form 12-25C, Operator Maintenance
Requirements for Environmental Equipment, Air Conditioners, 9,000 BTU.

13 Mar 81

Air Conditioner 9,000 BTU/HR
Hottel Model HAC-751

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
---------	------------	-----------	----------

6

2-1
a

IN THIS SPACE TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine is 6 Cylinders. The engine on my set only has 4 Cylinders. Change the manual to show 4 Cylinders.

B1

4-3

Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is Call a shim - Please Correct one or the other.

125

line 20

I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered so the NSN is

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

COMMANDER

U S ARMY SUPPORT AND AVIATION MATERIEL READINESS COMMAND

ATTN: DRSTS-MTT

4300 GOODFELLOW BOULEVARD

ST. LOUIS, MO 63120

5-4120-341-13

13 Mar 81

Air conditioner 9,000 BTU/HR
Hottel Model HAC-751

EXACT. PIN-POINT WHERE IT IS

GE
DPARA-
GRAPHFIGURE
NOTABLE
NOIN THIS SPACE TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT:

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

COMMANDER
U S ARMY SUPPORT AND AVIATION MATERIEL READINESS COMMAND
ATTN: DRSTS-MTT
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120

ICATION NUMBER

PUBLICATION DATE

PUBLICATION TITLE

5-4120-341-13

13 Mar 81

Air Conditioner 9,000 BTU/HR
Hottel Model HAC-751

EXACT PIN-POINT WHERE IT IS

GE

PARA-
GRAPHFIGURE
NOTABLE
NOIN THIS SPACE TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT:

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

CDMMANDER

U S ARMY SUPDRT AND AVIATION MATERIEL READINESS CDMMAN

ATTN: DRSTS-MTT

4300 GODDFELLDW BDULEVARD

ST. LOUIS, MO 63120

TM 5-4120-341-13

13 Mar 81

Air Conditioner 9,000 BTU/HR
Hottel Model HAC-751

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA- GRAPH	FIGURE NO	TABLE NO
------------	----------------	--------------	-------------

IN THIS SPACE TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT:

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

COMMANDER

U S ARMY SUPPORT AND AVIATION MATERIEL READINESS COMM.

ATTN: DRSTS-MTT

4300 GODDFELLOW BOULEVARD

ST. LOUIS, MO 63120

1 millimeter = 10 millimeters = 0.254 inches

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 dekagram = 10 grams = .35 ounce
 1 hectogram = 10 dekagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
centimeters	inches	.39	inches	centimeters	2.54
feet	meters	.305	meters	feet	3.28
meters	feet	.305	feet	meters	3.28
kilometers	miles	.62	miles	kilometers	1.61
square centimeters	square inches	6.45	square inches	square centimeters	.16
square meters	square feet	.11	square feet	square meters	.093
square meters	square yards	.836	square yards	square meters	.836
square kilometers	square miles	2.59	square miles	square kilometers	.26
square hectometers	square miles	.405	square miles	square hectometers	.25
cubic meters	cubic feet	35.3	cubic feet	cubic meters	.028
cubic meters	cubic yards	1.35	cubic yards	cubic meters	.766
milliliters	fluid ounces	29.6	fluid ounces	milliliters	.034
liters	quarts	.264	quarts	liters	.757
liters	gallons	.264	gallons	liters	3.79
liters	quarts	1.06	quarts	liters	.946
grams	ounces	28.35	ounces	grams	.028
kilograms	pounds	2.2	pounds	kilograms	.454
metric tons	short tons	.907	short tons	metric tons	1.1
newton-meters	foot-pounds	1.356	foot-pounds	newton-meters	.738
newton-meters	foot-pounds	.738	foot-pounds	newton-meters	1.356

Temperature (Exact)